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Earle, Timothy

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Basic Biographical Information

Timothy Earle (Fig. 1) is an anthropological archaeologist whose interests center on the political economies of intermediate societies (chiefdoms) and archaic states. Earle received a BA from Harvard College (1969) and a PhD from the University of Michigan (1973). He was a Professor of anthropology at the University of California, Los Angeles, from 1973 to 1995 and Director of UCLA's Institute of Archaeology from 1987 to 1992. He spent a year as a Visiting Professor at the University of Cambridge (1986–1987). In 1995, he joined Northwestern University as Chair of the Department of Anthropology and became Professor Emeritus in 2011. He served as President of the Archaeology Division of the American Anthropological Association (1993–1997) and as Mercator Fellow of the Department of Archaeology, University of Cologne (2015). He was elected to the Executive Committees of the American Anthropological Association (1999–2002) and of the Human Relations Area Files (2008–2011). In 2002, he delivered the Archaeology Division's annual distinguished lecture (Earle 2004). In 2013, he was elected to the American Academy of Arts and Sciences.

Major Accomplishments

Strongly evolutionary in its orientation, Earle's research is grounded in materialist approaches. Focused initially on the economic foundations of leadership, his interests widened to encompass ideology, culture, and agency, as well as exploring corporate forms of sociopolitical organization. The broad comparative sweep of his thinking is best reflected in *The Evolution of Human Societies* (first ed., 1987, second ed., 2000), co-authored with Allen Johnson. Unparalleled as a contribution to multi-linear social evolutionary theory, the book investigates the causes, mechanisms, and patterns of change through 19 ethnographic and archaeological case studies. Subsistence intensification, political integration, and social stratification are characterized as interdependent processes that unfold in varied environments – at distinct societal scales – across the globe. His most influential book, *How Chiefs Come to Power* (1997), compares the evolution of chiefdoms in three areas.

In Polynesia, the Andes, and Europe, Earle's archaeological field projects have incorporated rigorous testing of economic questions alongside innovative methods. As a doctoral student investigating irrigation, he mapped engineered landscapes in Hawaii as part of Marshall Sahlins' Hawaiian Social Morphology and Economy project (1971–1972). Demonstrating that land tenure translated into political control, (Earle 1978) argued that redistribution mobilized surpluses predominantly to finance elite domination rather than to even out access to

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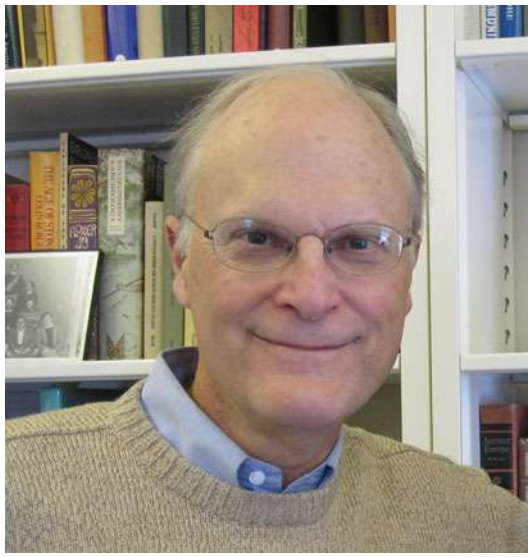

Earle, Timothy, Fig. 1 Tim Earle. (Photo: Kristian Kristiansen)

resources. Before the word *agency* entered common parlance, Earle recognized that leaders can – and do – influence trajectories of sociopolitical change. Earle and Spriggs (2015) present this Marxist orientation. In publications with Jonathon Ericson and Andrew Christenson, Earle elaborated approaches designed to examine exchange and to introduce formal economic modeling to archaeology (Earle and Ericson 1977; Earle and Christenson 1980; Ericson and Earle 1982).

Earle then established the Upper Mantaro Archaeological Project in Peru (1977–1986, with T. D'Altroy, C. Hastorf, and C. Scott) to investigate how the political and social upheavals of the Inka conquest affected the local household economy (particularly craft specialization and exchange). Excavations in centers and villages allowed comparison of households of different statuses, occupied before and after conquest. Densities of ceramic wasters, spindle whorls, and lithic debris were calculated, as well as ratios of finished goods to tools and debris. Detailed comparisons of diet, craft production, and consumption revealed that the economy saw the intensification of surplus production but little change in craft production or exchange. Instead, wealth goods controlled by the Inkas largely replaced local prestige goods for status legitimation and became less concentrated in elite compounds (Costin and Earle 1989).

In a collaborative publication with Terence D'Altroy, (D'Altroy and Earle 1985), Earle highlighted staple finance and wealth finance as contrasting political strategies, with implications for both ideologies and institutions of control. Subsequently, he edited a volume with Elizabeth Brumfiel (Brumfiel and Earle 1987) in which contributors investigated craft specialization in emergent political economies, making a distinction between *attached* and *independent* specialists. Acknowledging diverse local circumstances, contributors agreed that specialist craft activity was often organized by elites to strengthen their existing positions; specialization was therefore more a *consequence* than a *cause* of complexity.

In the mid-1990s, Earle turned his attention to the material basis of ideology. He argued that effective leadership depended not only upon economic control but also upon coercive force as well as ideologies that instituted and structured power relations. In discussions with Elizabeth DeMarrais and Luis Jaime Castillo, ideas about the materialization of ideology were developed to explain how messages about power became widespread, visible, and controlled. Part of a special section of *Current Anthropology* in 1996, this entry appeared with two companion articles that jointly focused attention on the agency of leaders and on ideology as a source of power.

Political instability in Peru led Earle to turn his attention toward Europe, where he established a highly successful collaboration with Kristian Kristiansen. The Thy Archaeological Project (1990–1997, co-directed with K. Kristiansen and M. Rowlands) investigated Neolithic and Bronze Age landscapes. Innovations in field methods united the paleoenvironmental reconstruction studies of Danish researchers with techniques including settlement survey and field excavations accompanied by full screening. Plow soil sampling (developed with J. Steinberg) facilitated identification and description of occupations in disturbed contexts, allowing detailed diachronic reconstruction of landscapes and settlement. Results showed that control of prestige goods (particularly bronze), as well as the creation

of property rights through construction of monuments, underpinned the emergence of regional elites and hierarchical sociopolitical structures. This Scandinavian research is published in another article in *Current Anthropology* (Ling et al. 2018). As part of a subsequent three-region comparison of Bronze Age societies (Earle and Kristiansen 2010), Earle has conducted a regional survey of Benta Valley, Hungary, which used rapid assessment of prehistoric, plowed-out sites to explore specialist production and regional exchange networks. He postulated that, despite the emergence of a commodity trade in metal, no evidence existed for regional control of staples or for emergent market economies (Earle et al. 2011). Looking at inter-regional metal trade during the Middle Bronze Age, he developed the idea of bottlenecks created by emerging elites to siphon off metal wealth (Earle et al. 2015).

Throughout his career, Earle's enthusiasm for anthropology led him to develop and to promote a four-field, integrated vision for the discipline. At UCLA, he was at the center of a dynamic group of researchers (including Jim Hill and Merrick Posnansky); many of his graduate students went on to develop innovative approaches to political economy. At Northwestern, Earle helped to create a distinguished four-field program that provides a model for other universities. Energetic and deeply committed to supporting colleagues, Earle maintains collaborations and friendships with former students, many now in posts in leading research universities. Through his own substantial publication record, as well as through mentoring of doctoral students and colleagues, Earle has been among the most influential archaeologists of his generation.

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Early Complex Society in South America, The Development of

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Introduction

All human societies are complex, some more than others depending on definitions and variables (e.g., technology, language, kinship). In archaeology, complex societies typically refer to political systems with permanent forms of inequalities and some degree of occupational specialization. To describe those, scholars have developed many categories including middle-range, ranked, stratified, chiefdoms, states, and civilizations. Overall, complex societies contrast with egalitarian systems, often called bands and tribes, where social differences are usually based on sex, age, and personal qualities.

South America has long been recognized as a center of primary state formation, with the Inca Empire standing as the historical culmination of this process. While early cultural historical research focused on art and monumental architecture, neo-evolutionary models and the processualist movement tried to explain the dynamic and systemic development of inequalities. Causal relationships were often sought between ecological, economic, demographic, social, political, and religio-ideological variables including the role of culture-nature relations, conflict, and the structural needs for larger and more complex political institutions.

This essay provides a brief summary of the archaeological study of the development of early complex societies in South America prior to the development of state-level polities. Building on a conceptual survey and review of the history of archaeological research, the core of the essay offers an overview of central issues and debates, including insights into regional variations from the Intermediate Area, the Andes, the Amazonian lowlands, and the Brazilian Highlands. The essay focuses on materialist and evolutionist models that have historically informed our understanding of the development of early social complexity in South America. For the sake of space, this entry focuses on early forms of social complexity, leaving untreated clear cases of state-level societies including the Moche, Tiwanaku, Wari, Lambayeque/Sicán, Chimú, Chancay, and Inca. Other entries in this encyclopedia treat in detail state and empire formation, as well as many of its pre-Columbian manifestations in South America (see Central Andes: Origins of Prehispanic State; Inca State and Empire Formation; Moche, Geography and Culture of; Tiwanaku, Geography and Culture of; Wari, Geography and Culture of).

Definition

Since humans – like other great apes – have a tendency to form dominance hierarchies, no human society is truly egalitarian. Yet, in some groups the number of social roles and statuses is limited, and permanent inequalities are absent. In such societies, which tend to be small in scale, differences are mainly based on age, sex, and other personal qualities. Here social statuses and roles tend to be achieved rather than ascribed. These societies, which commonly rely on hunting-gathering-foraging economies, have a strong egalitarian ethos often manifested in the lack of private property and prescriptions against material accumulation. In contrast, some societies display permanent and institutionalized forms of social inequalities and political power. Those tend to be larger in scale, settle in denser and more permanent ways, rely on surplus subsistence economies and extensive storage, and display some level of occupational specialization.

Since the writings of Enlightenment philosophers like Thomas Hobbes (1588–1679) and Jean-Jacques Rousseau (1712–1778), the origins of permanent social inequalities have been the topic of much debate. Beyond early and unilineal evolutionary attempts, such as Lewis H. Morgan (1818–1881) "savagery, barbarism, civilization" scheme, scholars have classified societies based

on variations in social and political organization. A series of categories and concepts have been coined to account for such variations. Most can be traced for the most part to the writings of Elman Service (1915–1996) (bands, tribes, chiefdoms, states) and Morton H. Fried (1923–1986) (egalitarian, ranked, stratified, state societies), who themselves drew heavily from Karl Marx's (1818–1883) notion that rank is closely linked to differential access to modes and means of production. Service and Fried's categories and their evolutionary implications have been vigorously debated and their archaeological applications questioned, modeled, and remodeled repeatedly.

Bands can be defined as egalitarian and demographically small (25–50 people) societies in which group membership is fluid and principally based on kinship. Subsistence strategies center around the exploitation of wild food sources including hunting, fishing, and gathering. The more controversial concept of tribe refers to groups that are also considered egalitarian but demographically larger. Here, membership is based on kinship, yet fixed. Both foraging and food-producing subsistence economies are habitually associated with tribal societies. In tribal societies, lineages are sometimes ranked.

The concept of chiefdom refers to stratified societies in which leadership positions are ascribed rather than achieved. Many typologies have been developed to account for the organizational variability of chiefdoms, but little consensus exists. Famous definitions and studies have been put forth by Colin Renfrew, Donnan Taylor, Irving Goldman, Vincas P. Steponaitis, William F. Keegan and Morgan D. Maclachlan, Richard S. Blanton, Robert D. Drennan (born 1947), and Gary M. Feinman. Chiefdoms are demographically large, and decision-making processes are centralized with a two-tier decision-making hierarchy. Yet, leadership lacks coercive and military power as chiefs usually rely on social capital and redistributive strategies to build and maintain a base of followers. Both foraging and food-producing economies correlate with chiefdoms.

From a cultural evolutionary standpoint, the concept of chiefdom was defined as a transitional stage between ranked tribal societies and state-level societies. Although it has been the subject of much criticism, most scholars still recognize a broad class of middle-range societies as chiefdoms. Of particular interest to this essay, South American ethnographic and archaeological case studies have often been used to exemplify the organizational variability of chiefdoms.

At the more complex end of the sociopolitical spectrum, states are large-scale stratified societies, with minimally a three-tier decision-making hierarchy. Here, leadership benefits from coercive power, and states usually have a territorial base. Preindustrial states have been given various names including primitive states, archaic states, civilizations, high civilizations, and early states.

In addition to the aforementioned categories, transegalitarian societies refer to groups that are neither egalitarian nor ranked. In transegalitarian arrangements, there may be unequal access to prestige, but the number and access to prestige positions are fluid. Social statuses are achieved and usually based on generosity and the ability of leaders to attract followers. Similarly, the concept of middle-range societies is broad and encompasses groups falling between bands and states, including tribes, ranked societies, and chiefdoms.

In sum, complex societies refer to various categories of the anthropological literature including middle-range societies, ranked tribal societies, chiefdoms, stratified societies, and early states. In this essay, I focus on non-state complex societies that developed in South America (Fig. 1).

Historical Background

Early attempts at tracing the origins of South American complexity were anchored in cultural historical methods and diffusionist ideas. This traditional view envisioned the rise of social complexity alongside the spread of pottery and agriculture, in particular maize and manioc. James A. Ford (1911–1968), for instance, argued that pottery, ground stone tools, fired-clay figurines, and agriculture diffused from Peru to the Eastern USA. Others, including Betty J. Meggers (1921–2012), suggested transoceanic contacts

Early Complex Society in South America, The Development of, Fig. 1 Map of South America

between East Asia and coastal Ecuador as seen through similarities in early pottery styles and technologies of the Jōmon and Valdivia cultures. In the Central Andes, following the lead of Julio C. Tello (1880–1947), the Chavín phenomenon was labeled as the first Andean civilization. Michael D. Coe (born 1929) and John H. Rowe (1918–2004) argued about the potential cross-influences between Chavín and the Mesoamerican Olmecs. Archaeological research has since contradicted the diffusionist paradigm. For instance, pottery developed independently in lowland Brazil, northern Colombia, coastal Ecuador, and the central coast of Peru. If the origins of pottery now appear more complex than originally thought, the same thing can be said of the development of village life, the adoption of agriculture, and incipient monumental architecture.

The first systematic attempt at describing indigenous and prehistoric South American peoples can be found in the *Handbook of South American Indians*, a six-volume monographic series (plus index) published by the Smithsonian Institution under the editorial guidance of Julian H. Steward (1902–1972) (Steward 1946a, 1946b, 1948a, 1948b, 1949, 1950, 1959). One of the underlying claims of Steward was that cultural ecological conditions are intricately related to evolutionary trajectories and societal types (e.g., Andean civilizations, Circum-Caribbean tribes). For Steward, South American ethnographers and archaeologists should move beyond the concept of "culture area" to "culture type." In this framework, cultural cores for the development of civilizations, chiefdoms, and tribes were to be found in the Andes, the Intermediate Area, and the Amazonian lowlands, respectively. This fueled an Andean-centric vision of South American prehistory, alongside eco-deterministic assumptions about incipient complex societies. Recent research away from the Andes has expanded our understanding and provided empirical foundations to explore the development of complex societies in different types of environments and geographic settings including the Intermediate Area, the Amazonian lowlands, the Orinoco and La Plata basins, as well as their associated plateaus.

For Americanist archaeologists, the development of complex societies is often synonymous with the "Formative," a period that is roughly the equivalent of the Neolithic. The concept emerged as part of development-evolutionary chronological frameworks such as those framed by Edward P. Lanning (1906–1981) and Luis Lumbreras (born 1936). Those schemes contrast with the "horizon/intermediate period" chronologies generated by the work of Max Uhle (1856–1944), Tello, Dorothy Menzel, Rowe, and Lawrence E. Dawson. As defined by Gordon R. Willey (1913–2002) and Philip Phillips (1900–1994), the Formative refers to the rise of agricultural food production and permanent patterns of settlement. Nowadays, the term "Formative" is often loosely used to refer to the changes in social complexity linked to village life, incipient craft specialization, public architecture, social inequalities, hierarchical political systems, and long-distance trade.

Key Issues/Current Debates

There is no single consensus on human social evolution or a unique model that explains the emergence of complexity. Societies develop along many lines, although outcomes are fairly limited. From such a multilineal evolutionary standpoint, some of the final and proximal causes of social inequality include high populations, specialization and regional interaction, feasting, productive subsistence bases and surpluses, sedentism, subsistence intensification, and competition and warfare.

A key matter is the relationship between hierarchical societies and surplus subsistence economies and in particular agriculture. Traditionally, archaeologists have assumed that agriculture is necessary for the production of surplus, one of the crucial preconditions for the establishment of social inequalities, occupational specialization, and redistribution. V. Gordon Childe (1892–1957) contributed in seminal ways to the premise that, in complex urban societies, large segments of the population are detached from primary subsistence activities. In South America, this translated into a

transfusion of Old World models, including Karl August Wittfogel (1896–1988) emphasis on the importance of hydraulic technologies and irrigation in the rise of bureaucratic institutions. This approach nourished interest in alluvial river valleys of the Pacific coast and contributed to the perception that those were the only production zones where complex societies could thrive.

Research by Michael E. Moseley (born 1941) challenged the importance of irrigation agriculture in the rise of complex societies on the coast of Peru and brought attention to the importance of marine adaptations. In his influential *The Maritime Foundations of Andean Civilization* published in 1975, Moseley argued that the rich Pacific littoral offered predictable and abundant wild resources that provided the impetus for prosperous foraging economies and the extraction of significant surplus. Based on the presence of numerous monumental platforms, he inferred that large-scale maritime populations thrived prior to the introduction of agriculture. In the early 1980s, a series of publications authored by J. Scott Raymond, David J. Wilson, Jeffrey Quilter, and Terry Stocker critically examined Moseley's claims and the validity of the maritime hypothesis.

The role of conflict and warfare has also been a cornerstone in the archaeological study of early complex societies in South America. Based on ethnographic data, Robert L. Carneiro (born 1927) developed an environmental circumscription or warfare theory for the origin of the state. For him, the geographically bounded coastal oases of the Andes represent ideal archaeological case studies to test the interplay between population pressure and warfare in the rise of political hierarchies. While survey archaeologists such as Richard E. Daggett, Brian R. Billman, David J. Wilson, and Hugo Ikehara have had difficulties confirming Carneiro's model and the causal role of warfare in the consolidation of early political authority, inter-grupal conflicts do appear to have played a significant role at the end of the first millennium BC in the Central Andes.

While materialist and evolutionist approaches have long informed our understanding of the development of early social complexity in South America, some scholars emphasize the role of religion and ideology in shaping early forms of complexity. For instance, Richard L. Burger (born 1950) and Edward R. Swenson contend that religion was at the heart of the labor mobilization and sociopolitical orders and suggest that prestige and authority were achieved through ritual expertise and generosity (rather than wealth). For them, such valuation of labor sets the Andes apart from other complex social formations.

All in all, no single model or theory accounts for the development of South American complex societies. Following the emergence of alternative models to the processualist movement in the early 1980s, archaeologists have spent considerably less effort in trying to develop explanatory and systemic models. Yet, our knowledge of regional developmental sequences has increased significantly due to sustained field research, in particular in regions where non-state complexity was previously unknown or little documented.

Regional Variations in Early South American Complex Societies

Intermediate Area

The Intermediate Area witnessed the development of chiefdom societies during the first millennium AD. As discussed by Drennan in SW Colombia, four groups of chiefdoms can be identified in Alto Magdalena (San Agustín), Tumaco, Calima, and Muisca. These societies mobilized labor toward the erection of earthen mounds and mortuary monuments, as well as craft specialists including stone sculptors and metal workers.

Andean Region

With the publication of the *Handbook of South American Indians*, the region became synonymous with the rise of complex societies at the detriment of other geographic regions perceived as being of lesser productive potential. While early views focused on Chavín, more recent studies indicate the development of diverse forms of hierarchical political systems, some prior to the introduction of pottery and agriculture.

North Andes

The work of Clifford Evans (1920–1981), Betty J. Meggers, and Emilio Estrada (1916–1961) in the late 1950s and early 1960s at the Valdivia Complex was seminal in South American archaeology. Here, early complex societies are best known from coastal Ecuador with the Valdivia culture and pottery (3500–1800 BC). In the 1970s, Donald W. Lathrap (1927–1990) and Jorge Marcos (born 1932) explored the public monuments and mortuary patterns at Real Alto. They documented elaborate funerary arrangements and architectural settings interpreted as ceremonial buildings including a mortuary facility and feasting hall. Complex societies also developed in the highlands of Ecuador. Fieldwork by Francisco Váldez indicates human occupation between 3000 and 200 BC, with major episodes of construction between 2600 and 1700 BC. Excavations by Jerry D. Moore in the Department of Tumbes in the far northern region of Peru indicate the emergence of village life as early as 4750–4320 BC. At the hamlet site of El Porvenir, half a dozen houses surround a plaza.

Central Andes

In the Central Andes, the emergence of social complexity is best documented along the north and central coasts, as well as the highlands of Peru. Here, the main lines of inquiry have been monumental and ceremonial architecture. Early complex developments are also reported from the Lake Titicaca Basin, in particular at the site of Chiripa and the Yaya-Mama tradition.

Early preceramic non-agrarian maritime villages on the coast of Peru have been documented by Daniel H. Sandweiss and Elizabeth J. Reitz at Quebrada Jaguay and the Ring site. At Huaca Prieta, excavations by Junius B. Bird (1907–1982) in the 1940s documented a 12-m-high mound surrounded by small stone structures. Based on the abundance of refuse (including food remains, textiles, and bottle gourds), Bird estimated that several hundred people lived at the site. In 2006, Thomas D. Dillehay (born 1947) and Duccio Bonavia (1935–2012) initiated additional operations at Huaca Prieta, demonstrating much earlier human occupations, perhaps as early as the late Pleistocene. Permanent settlements emerged by 7000–5500 BC, and moundbuilding did not develop from gradual accumulation of occupation midden but by deliberate and gradual planned moundbuilding. A recent volume edited by Dillehay (2017) summarizes the results of this significant project on the human occupation of Huaca Prieta.

Áspero (3700–2500 BC) in the Supe River was first studied by Willey and John Corbett and later excavated again by Robert A. Feldman in 1973–1974. Here, a 12 ha midden and seven artificial mounds suggest substantial residential populations. At Huaca de los Sacrificios, excavations revealed the burial of an infant accompanied by elaborate grave goods and exotics. The context contrasts with the grave an adult buried without any offering, a combined finding interpreted as evidence of ascribed status. At the nearby Huaca de los Ídolos, a ceremonial precinct along with figurines was discovered.

After 3000 BC, public architecture is ubiquitous on the central coast of Peru. El Paraíso (2400–1200 BC) was a ceremonial center of the Chillón Valley investigated by Frédéric Engel (1908–2002). More recent research by Ruth Shady (born 1946) at Caral (2600–1900 BC) and more broadly the Norte Chico region has yielded insights into dozens of monumental sites with raised platforms, sunken circular courts, plazas, and extensive residential zones between 3100 and 1800 BC. Based on settlement pattern analyses, Jonathan Haas, Winifred Creamer, and Alvaro Ruíz suggest that Late Preceramic Norte Chico was characterized by a symbiotic coast-inland interaction networks with inland centers occupying prominent political roles. They interpret the presence of botanical remains of cultigens as contradicting Moseley's hypothesis. For Haas and others, the sole presence of corporate architecture can be interpreted as a proxy for hierarchical social organization and centralized political systems. In contrast, fine-grained excavations by Rafael Vega-Centeno at Cerro Lampay (2400–2200 BC) suggest limited institutionalized authority and the need for social leaders to sponsor multiple, spontaneous, and recurrent small-scale work feasts in order to mobilize labor.

Late preceramic complex societies in the Peruvian highlands are often grouped under the umbrella of the Kotosh or Mito tradition. While the ritual chambers associated with this phenomenon are fairly homogeneous throughout the highlands, variations in size and numbers of ceremonial precincts point to groups of varying scales. The sites of Kotosh, Huaricoto, La Galgada, Piruru, Hualcayán, and Cosma have been associated with those developments and roughly dated between 3000 and 1500 BC. Kotosh and La Galgada are probably the best known of these. They were excavated by teams led by Seiichi Izumi, Toshihiko Sono, Kazuo Terada, and Terence Grieder (1931-2018), respectively. Recent research at Chavín de Huántar by Daniel A. Contreras suggest that similar architecture was incorporated into the site layout.

During the following Initial Period (1800–900 BC), and the introduction of pottery in coastal Peru, complex societies have been documented in association with the Cupisnique (north coast), Sechín (Casma Valley), and Manchay (central coast) phenomena. Rafael Larco Hoyle (1901–1966) pioneered research on the Cupisnique culture. Since Larco focused on grave contexts and associated grave goods, often with little contextual data, little insights were gained into sociopolitical structures. Excavations were carried out by Michael E. Moseley, Luís Watanabe, William J. Conklin, Thomas Pozorski, and more recently Jason Nesbitt at the Initial Period center of Caballo Muerto (2100–1200 BC), leading to some controversy over its building sequence and sociopolitical implications. Since 2007, Walter Alva (born 1951) and Ignacio Alva have been reporting on the discovery of spectacular painted murals dating back to more than 2000 BC at the temple sites of Ventarrón and Collud-Zarpán in the Lambayeque region.

Early complex societies on the Pacific coast are also well known from the Casma Valley at sites that include Las Haldas, Pampa de las Llamas-Moxeke, Sechín Bajo, Cerro Sechín, and Sechín Alto. The following early archaeological works in the 1930s by Tello, Rosa Fung (born 1935), Tsugio Matsuzawa, Terence Grieder, Peter Fuchs, Jesús Briceño, Shelia Pozorski, and Thomas Pozorski have investigated the Initial Period in Casma. Shelia and Thomas Pozorski suggest the development of state-level polities, one of those centered at the monumental center of Sechín Alto (2150–1400 BC). For them, the sheer scale of constructions and high levels of architectural and settlement planning point to hegemonic forms of political authority. This position is debated on the basis that Initial Period contexts have yet to reveal elite burials. In contrast, Burger and Lucy C. Salazar suggest that the large scale of the mounds is the result of multiple and relatively modest building episodes. Their fieldwork has focused on the Manchay culture of the central coast at sites such as Mina Perdida, Cardal, and Manchay Bajo. Previous fieldwork by Rogger Ravines (born 1942) and William Isbell at the Initial Period site of Garagay has fostered fascination with mural art and architectural sculptures.

Contemporary painted murals and temple architecture have been reported by Claude Chapdelaine and Tello from the valleys of Santa (San Juanito) and Nepeña (Punkurí, Cerro Blanco). More recently, field research by Koichiro Shibata at Cerro Blanco and Huaca Partida, in the lower Nepeña Valley, have brought renewed interest in Initial Period mural art and their implications to understand Cupisnique, Sechín, and Chavín interactions in the region.

In sum, the Initial Period in coastal Peru saw the rise of thousands of public buildings at hundreds of sites. Those varied in size, complexity, and density, and some displayed significant degree of planning and urban-like densities. Yet, the scale of regional integration of these local polities remains unclear and debated.

Toward the end of the Initial Period, the site of Chavín de Huántar (1000–500/400 BC) rose to prominence in the north-central highlands of Peru. It gained prominence during the Early Horizon (900–200 BC), and much has been written about the influence of Chavín across the Andes, including its relation to the Cupisnique, Sechín, Manchay, and Paracas phenomena. First studied by Tello in 1919, the site attracted significant attention and rapidly became iconic and foundational to prehistoric cultural historical and evolutionary narratives. An extensive literature delves into Chavín de Huántar and its associated cultural manifestations. The site was a ceremonial center in which monumental stone buildings, including temples, subterranean galleries, canals, and offering caches, were surrounded by a

proto-urban settlement. Elaborate stone sculptures adorned many buildings and depict a complex cosmology centered around key therianthropic beings. Although the dating of Chavín de Huántar has recently been the subject of renewed scrutiny, most Andeanists still recognized the existence of Chavín sphere of influence across the Andes. At the same time, research in the neighboring coastal Ancash region suggests that Chavín interaction zone was not continuous and that some groups avoided, ignored, and/or rejected Chavín precepts. In the lower Nepeña Valley, excavations by David Chicoine, Hugo Ikehara, and Matthew Helmer at Huambacho, Caylán, and Samanco point toward the development of early urban forms of settlement organization during the Early Horizon.

In the north-central highlands, Chavín developments were followed by centuries of armed conflicts and inter-grupal warfare. During the following Early Intermediate Period (200 BC–AD 600), a confederation of non-state complex societies emerged along the Callejón de Huaylas in conjunction with the Recuay art style. Fieldworks by Terence Grieder, Joan M. Gero (1944–2016), and George F. Lau at Pashash, Queyash, Chinchawas, and Yayno have brought insights into the rise of what could be called warring chiefdoms whose ceremonial practices unified around feasting and ancestor worship.

On the south coast of Peru, the Early Intermediate Period marked the transition from Paracas (800–100 BC) to Nazca (200 BC–AD 600). Multiple research projects by Helaine Silverman, Donal A. Proulx (born 1939), Christina A. Conlee, Kevin J. Vaughn, and Hendrik Van Gijseghem at Cahuachi, La Tiza, Marcaya, and La Puntilla have brought insights into nonurban complexity and the sustained role of pilgrimage, ceremonial constructions, feasts, and ritual craft production in the integration of middle-range societies in this arid region.

South Andes

Research by Elizabeth DeMarrais, Juan Leoni, and Félix Acuto in NW Argentina has yielded data on the emergence of village life around 100 BC followed by a period of regional development and population growth after AD 1000. Based on excavations at the site of Borgatta (AD 1000–1400) in the Calchaquí Valley, where more than 250 residential enclosures are arranged in patio groups, DeMarrais suggests that little evidence of social inequalities and integrative political activities existed beyond the household level. She suggests that rituals, including mortuary practices such as urn burials of children, served to integrate community members in the absence of formalized structures of political authority.

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Amazonian Lowlands, Brazilian Highlands, and Atlantic Coast

Until recently archaeological research in the Amazon lowlands had been limited to the identification of "dark earth" or *terra preta*. Early villages are now documented from the Central Amazon and SW Amazon regions. Mound complexes have been reported from the upper Upano Valley in Western Amazon. Fieldwork by Ernesto Salazar indicates that village life flourished between 500 and 200 BC in the Ecuadorian Amazon. In the Central Amazon, efforts by Eduardo Góes Neves indicate scant evidence for intense human occupation before 500 BC, with a major surge in the visibility of human occupation after AD 500.

A similar situation can be observed in the middle and lower Amazon where human occupations are little visible prior to AD 1. For example, at the site of Marajó Island, at the mouth of the Amazon River, nonagricultural chiefdoms flourished after AD 400. Even though human occupations and ceramic deposits at Marajó Island go back to 1500 BC, complex societies did not develop for at least 1000 years. Here, the use of pottery and the establishment of sedentary communities were not immediate precursors to social complexification.

In Central Brazil, Irmhild Wüst and Cristiana Barreto have documented ring villages, some covering up to 90 ha. In these settlements, houses surround an open plaza, as community layout is still in use today and documented ethnographically by Claude Lévi-Strauss (1908–2009). Here, maize agriculture dates to 850 BC, while complex societies only developed after AD 800.

Some of the most fascinating recent discoveries in South America have been made in the Western region of the Amazon where hundreds of

monumental earthworks and ditch enclosures have been documented. Anthropogenic landscape modifications have many forms including canals, raised fields, causeways, and mounds. Most of these earthworks appear to date between AD 500 and 1500. Denise Schaan, Sanna Saunaluoma, and colleagues have documented more than 250 enclosures at the sites of Severino Calazans, Fazenda Colorado, and Jaco Sá. The combined evidence points to major anthropogenic modifications of the landscape (including deforestation), and supra-household forms of group labor. John H. Walker points out that the earthworks created a ring ditch that divided and organized space. The center of the earthworks appears to have been kept clean, a pattern consistent with public gatherings and other ceremonial activities.

Shell mounds (*sambaquis*) are widely distributed along the Brazilian coast and further south where human occupation goes back to 6000 BC and plant domestication and settled village life to 2000 BC. Sambaquis are large, up to 50 m high, and contain large amounts of food remains, mainly marine shells and fish bones. They are normally found in productive bays and nearby lagoons and date to the prehistoric period. The large amount of food refuse is interpreted as evidence of significant resident populations, although architectural remains of permanent dwellings are scarce. The absence of cultigens and groundstones is interpreted as reinforcing the foraging foundations of those complex societies who developed in productive coastal environments. In the Uruguayan portion of the Merín Basin, Robert Bracco documented 1500 mounds.

Future Directions

South American complex societies prospered in very different environments, ecosystems, and production zones and developed numerous and heterogeneous forms of social, ideological, and political arrangements as exhibited by varying degrees of complexities. Regionally, the imbalances between the Andes and other regions remain palpable. Methodologically, much headways were made in techniques of spatial analyses including fine-grained stratigraphy, architectural modeling, GIS, and remote sensing. Satellite imagery, drone photogrammetry, and lidar technologies are particularly useful to document buildings, earthworks, fields, and other human-made features. This is a burgeoning field, and remote sensing applications have yet to reach their full potential.

Archaeologists have routinely relied on variations in burial patterns and the qualities and quantities of grave goods to evaluate social inequalities, including kin- and class-based systems. Recent developments in bioarchaeology, in particular archaeothanatology, stable isotopes, and aDNA, help bring additional lines of evidence on complex living-dead interactions, diet, health, population movements, and phylogenies and ultimately contribute to our understanding of the forms, implications, and meanings of incipient social inequalities.

Theoretically, growing efforts are targeted at better framing of the social dynamics and political structures of South American complex societies as seen through the coupling of ethnographic and archaeological case studies. Indeed, archaeologists have realized the need to move away from trait list approaches and other typological exercises, which often lead to the selective adoption of definitions and/or traits that fit particular case studies and/or assemblages.

While a growing body of literature exists on the anthropogenic modifications of the South American landscape, with a recent surge in interest for the Amazonian region, archaeologists have yet to pay systematic attention to the materiality of complex societies and its various levels of entanglement. The recent material turn in archaeology and anthropology has emphasized the heterogeneity and importance of relationalities in the structuration of societies. The works of DeMarrais on materiality and heterarchy in NW Argentina and Bill Sillar on the dead and the drying in the Andes are particularly inspiring.

South American students are beginning to explore systematically the flows and entanglements of early form of complex societies and their impact on entrapments, path dependencies, and ecological transformations. From that standpoint, advances in the integration of geosciences and paleoclimatological proxies in their reconstructions of ancient human-environmental interactions have helped South American scholars to

augment our grasp of the diversity of past anthropogenic strategies and their role in incipient forms of social complexity. The archaeobotanical works of José Iriarte, George Gumerman IV, Christine A. Hastorf, Katherine L. Chiou, and David Goldstein are of special interest to students of early social complexity.

While a significant body of work exists on agency, gender, and practice, much remains to be done in the instrumentalization of poststructural agendas to the study of South American complex societies. By focusing on the capacity to act and to the intended and unintended consequences of actions, South Americanists could gain insights into the lives and identities of different groups, genders, and factions that interacted at the nexus of the sociohistorical development of unique and alternate forms of political leadership. One pioneering example of such an approach is represented by the comparative work of Gero on Moche and Recuay gender relations as seen through visual arts. At the same time, scholars have been increasingly interested in exploring differential ontological perspectives, many of whom finding inspiration in the anthropological work of Eduardo Viveiros de Castro (born 1951). The works of Lau on ancient alterity and Recuay art and archaeology as well as Mary J. Weismantel on Chavín de Huántar represent good examples of such approaches.

Finally, scholars studying the origins of urbanism and state formation should reassess and potentially decouple these concepts. As recently pointed out by Justin Jennings and Timothy K. Earle (born 1946), the diversity of South American settlement patterns and sociopolitical organizations might benefit from a consideration of nonurban complex societies as well as non-state urban developments. This could indeed lead to breakthroughs in documenting new forms of ancient complex social arrangements.

Cross-References

- ▶ Andes: Origins and Development of Agriculture
- ▶ Andes: Prehistoric Art
- ▶ Andes: Prehistoric Period
- ▶ Caral: The Sacred City
- ▶ Central Andes: Prehispanic Hunter-Gatherers
- ▶ Chiripa and the Emergence of Social Complexity in the Lake Titicaca Basin
- ▶ Inca State and Empire Formation
- ▶ Moche, Geography and Culture of
- ▶ Paracas, Geography and Culture of
- ▶ South American Geography and Chronology
- ▶ Tiwanaku, Geography and Culture of
- ▶ Wari, Geography and Culture of

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Early Excavations Around the Globe

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State of Knowledge and Current Debates

Introduction

For many people, the history of archaeology is synonymous with the history of excavation. In the public imagination, the two are barely separable, yet this very strong association is a comparatively recent phenomenon, and one that can be unhelpful in defining a discipline. By the same token, development in archaeological method consists of more than the refinement of techniques in the field; again, a focus on excavation can be limiting and deceptive. The early history of excavation is best treated as one aspect of the broader methodological and intellectual history that helps us to understand archaeology's emergence as a discipline, and so this brief summary aims to relate early excavations to these other developments.

Excavation is not synonymous with archaeology, but it is the central and most prominent tool of the modern discipline. Why? Fundamentally, excavation has developed as a research tool in response to changing perceptions – in general, increasingly positive over time – of the scope of the material remains of the past to reveal information about past lives and societies. The early history of excavation is in part the story of that developing sense of possibility in the physical exploration of ancient sites. It is a process rooted in European intellectual history, and hence the history of early excavations, even at a global level, is one dominated by European antiquarians and excavators (among other biases: an overwhelming majority of early excavators were male, and a large proportion were amateurs of independent means and high social rank). In its origins and as a human impulse, however, the exploration of the material remains of the past can be seen as a global phenomenon.

Precursors

There are many ancient examples of antiquarianism. The interest shown by ancient Mesopotamian kings in the monuments and inscriptions of their predecessors is well documented. Ancient sites and artifacts in the classical world might acquire associations with the Homeric past, while several accounts exist of Roman building work leading to the discovery of ancient ceramics and bronzes, even to looting of tombs and a trade in antiquities. In China, the collection and cataloguing of ancient jades and bronzes was an established elite activity from at least the tenth century CE.

In medieval Europe, historical work was focused heavily on texts. Perhaps the strongest interest in the material remains of the past came through the value of saints' relics. Excavations such as those of Helena of Constantinople to discover the remains of the True Cross had pious rather than historical motives. There was ambivalence toward pagan remains but also little apparent sense that the material remains of the past could provide much useful information. This could certainly not be said of the Italian Renaissance, in which ancient classical art and architecture were seen as enormously useful – though not so much as a source of information about the past as a source of instruction for the artists and architects of the present.

The crucial changes that underpin the modern discipline of archaeology are specifically those of the Enlightenment. The philosophical turn toward empiricism and a greatly increased confidence in the explanatory power of observation and

experiment that characterizes eighteenth-century European intellectual culture enabled material that was always visible to be seen in a new light and for the investigation of questions about the ancient past to take new forms. These momentous changes reveal themselves first in the interpretation of discoveries and subsequently in the methods used to pursue questions about the past.

Italy

Eighteenth-century discoveries near Naples, in the shadow of Mount Vesuvius, were to demonstrate vividly the capacity of excavation to reveal past lives. In 1709, the chance discovery of marble blocks in an area southwest of the volcano led the Austrian Prince D'Elbeuf, Emmanuel de Lorraine, to buy the land and begin excavations, not for the sake of antiquities but for marble as a building material for his own villa. What his workmen found was a wealth of classical statuary; though no one realized the fact at the time, they had been fortunate enough to dig down to the stage of the theater of ancient Herculaneum, strewn with statuary from the theater's destruction by the eruption of Vesuvius in CE 79. Herculaneum had been buried below many meters of lava, and finds were tunneled from the rock in a largely haphazard fashion until 1716.

Twenty years later, the Prince D'Elbeuf's house became the home of Charles of Bourbon, King of Naples and Sicily (later Charles III of Spain), and of his queen-consort Maria Amalia of Saxony, who is reputed to have persuaded her husband to reopen the excavations. Charles placed these excavations under the charge of an engineer, Rocco Gioacchino de Alcubierre, who continued the earlier laborious (and destructive) practice of tunneling. In 1748, however, Alcubierre became aware of another nearby site where statues had been discovered. This site proved far easier to excavate than Herculaneum: although both had been destroyed by Vesuvius, the new site had been buried by ash rather than lava. In 1763, an inscription would reveal the site to be the city of Pompeii.

How to understand the sculptures and frescoes that emerged at Herculaneum and Pompeii? The answer was provided almost entirely by the German art historian Johann Joachim Winckelmann. After initial scholarly successes in Germany, Winckelmann moved to Rome in 1755 and from 1758 was employed by the antiquities collector Cardinal Albani. From 1763, he was supervisor of antiquities for Rome and its surrounding area, and as such, he visited both Herculaneum and Pompeii, where he was aghast at the brutal excavation techniques being used. Winckelmann saw a direct connection between social and political conditions and artistic production, arguing that the finest works of art depended on political freedom. He did not apply the principle consistently, but the idea stuck, in part because of the sheer brilliance of his prose: his *History of the Art of Antiquity* (1764) was uniquely influential, shaping European attitudes to ancient art and ensuring a special reverence for classical art. The subsequent (nineteenth century) enshrining of the Parthenon sculptures of democratic classical Athens as the highest artistic achievement of antiquity therefore represented both an aesthetic and a political judgment. The sculptures have become a potent symbol in the modern world, and the removal of many of them from the Parthenon and their shipment to London by Thomas Bruce, Earl of Elgin, at the beginning of the nineteenth century has provoked one of archaeology's most enduring controversies.

Northern Europe: Antiquarianism to Archaeology

In 1533, Henry VIII appointed John Leland to the new post of king's antiquary. His work included a survey of the monuments of England and Wales, built on by William Camden, who in 1586 published the first general account of Britain's ancient monuments. Activities of this kind were soon taking place across northern Europe, as ancient monuments became incorporated into a broader interest in national identity and heritage and the development of national pasts peopled by vaguely but romantically imagined Celts, Gauls, and druids. In Britain, antiquarians such as John Aubrey in the seventeenth century and William Stukeley in the eighteenth combined increasingly methodical recording of ancient monuments with the construction of fantasies around them: Aubrey

was the first to connect the druids with Stonehenge. The problem lay in a lack of historical sources and chronology: the earliest accounts of Britons were those of Julius Caesar, and it was his description of a land gripped by druids and mysticism that Aubrey and Stukeley elaborated and applied to most ancient remains.

For much of the eighteenth century, the excavation of ancient mounds remained a hobby. Richard Colt Hoare and William Cunnington had higher ambitions than most "barrow diggers," seeking patterns in the many mounds they excavated, but the real developments in excavation methods came toward the end of the century with Augustus Henry Lane-Fox Pitt Rivers. A British general, Pitt Rivers' retirement from the army in 1880 allowed him to concentrate on his antiquarian interests, focusing on his own large estate of Cranborne Chase in southern England. His work represented a revolution in method and recording, based on a simple principle that still governs archaeological excavation today: that since excavation itself is destructive and excavators cannot know what information will be useful in the future, they should set out to record as much detail as possible, whether or not it seems important to them personally at the time.

By the end of the nineteenth century, work on chronology was having a major impact. The German historian Johann von Eckart had first proposed a three-age principle (a stone age succeeded by ages of bronze and iron) in the early eighteenth century, but it was not until the early nineteenth and Christian Thomsen's work in the new Danish National Museum, attempting to classify its collections, that the idea was applied and developed into a usable tool. Thomsen's student Jens Worsaae took the system into the field, identifying the recurring characteristics of Stone, Bronze, and Iron Age burial mounds in Denmark and demonstrating the potential interpretive power of Thomsen's approach.

These dating methods were relative, capable of establishing the order of material in a sequence but not of applying absolute dates. In this field, the pioneer was the Swedish archaeologist Gustav Oscar Montelius, who through careful classification was able both to establish more detailed regional sequences and to identify where they intersected. Montelius used imports and mixtures of material in the border areas between regions to synchronize their chronologies, ultimately linking them through Greece to Egypt, where a historical chronology was known and fixed to absolute dates through hieroglyphic inscriptions including astronomical observations. In this way, by 1910, at least some of Europe's Bronze and Iron Age prehistory could be tied to an absolute as well as a relative chronology.

Northern Europe: Human Antiquity

Northern Europe was also the key region in the establishment of a long prehistory for humanity. Until the middle of the nineteenth century, the vast majority Europeans believed the history of the world and of humanity's existence to have been relatively brief. The primary source of information on human antiquity was the Bible. Since the Middle Ages, most scholars had placed the world's creation somewhere between 3500 and 4000 BCE; Archbishop James Ussher's chronology produced in the seventeenth century and based on a creation in 4004 BCE became perhaps the most influential in modern times. Revising the chronology required not only the right empirical research but also the cultural changes that allowed for its conclusions to find recognition. In the mid-seventeenth century, the French protestant Isaac La Peyrère's *Men Before Adam* had been treated as heresy by the Inquisition and its author arrested. The years 1830–1833 saw the publication of Charles Lyell's *Principles of Geology*, a convincing argument for the principle of uniformitarianism in geology, i.e., the assumption that past geological processes were the same as those of the present. To accept this view was to allow an immense time span for the existence of the earth, though Lyell himself took a further 30 years to become convinced of a long prehistory for humanity. By this time Darwin had identified a mechanism, natural selection, capable of explaining the long-term processes of change scholars now saw in the fossil record, while other developments shed light on human prehistory. The mid-nineteenth-century discoveries of Boucher de Perthes in Picardy showed the

existence of worked stone tools in contexts associated with the bones of extinct animals such as the mammoth. What is special about Boucher de Perthes is not what he found – in this he had several predecessors: John Frere had tried to convince the Royal Society of the same conclusions as early as 1797 – but that his discoveries were the first to achieve wide acceptance. This came in 1859, following careful inspection of his own and other sites by scholars including Lyell.

The mid-nineteenth century also witnessed the first discoveries of Paleolithic art. In 1860, Eduard Lartet discovered the first certain example of Ice Age art, an engraved bone depicting a bear's head, at Massat in the French Pyrenees. Further examples followed, and 1879 saw the discovery of spectacular cave paintings at Altamira by Don Marcelino Sanz de Sautuola (or more accurately, his young daughter Maria, who looked at the cave's ceiling while he had been focused on the search for stone tools at the floor). Sadly, de Sautuola's discoveries were dismissed as a fraud in his own lifetime; shortly after his death, discoveries at other sites were to vindicate him completely. Émile Cartailhac, professor of prehistory at Toulouse, published a full retraction of his earlier attacks on de Sautuola and visited Maria to apologize in person for the harm he had done to her father's reputation.

Egypt

Nowhere was Anglo-French imperial competition mirrored by competition over antiquities so closely as in Egypt. In 1798, Napoleon invaded Egypt, bringing with him not only soldiers and engineers but also a Commission of Sciences and Arts, consisting of more than 150 scholars, whose role was to study the country, including its ancient monuments. Napoleon's hold on Egypt was short-lived, but the *savants* and their studies were to have an enormous impact. Produced over the next 20 years and involving hundreds more artists and technicians, the monumental *Description de l'Égypte* provided one starting point for the modern study of Egypt's ancient past. The other, also as a result of the Napoleonic invasion, was the Rosetta Stone, discovered in 1799 at Fort Julien, near Rashid (French "Rosette," English "Rosetta"). The name of its excavator, a French soldier, is unknown, though it was his commanding officer, one Bouchard, who shipped the stone to Cairo. The potential value of its long trilingual inscription for decipherment was immediately recognized: that one of the languages was Greek and could therefore be read easily gave a strong starting point. The British seized the stone itself, but it was a French scholar, the extraordinarily gifted linguist Jean-François Champollion, who was ultimately to decipher the hieroglyphic script.

Champollion's success was widely celebrated, but not all things ancient Egyptian were seen to have value. With none of the modern restrictions on excavation or export, collectors such as Richard Lepsius, Henry Salt, and the larger-than-life Giovanni Belzoni succeeded in removing colossal Egyptian sculptures to Europe, but their entry into the British Museum, in particular, proved controversial, with Egyptian sculpture denigrated as inferior to the art of classical Greece. Auguste Mariette, too, excavated and exported sculptures, though he also came to recognize the catastrophic damage uncontrolled excavation was doing in the country and was the first to take serious steps toward limiting both this and the flow of antiquities to Europe, introducing some controls and establishing the national museum in Cairo.

A revolution in method came with the work of William Matthew Flinders Petrie. Petrie's work was remarkable from the beginning: his first project in Egypt, in 1881–1883, was to produce the first accurate, detailed survey of the three great pyramids at Giza. He was to spend the next 40 years excavating throughout Egypt, setting new standards in excavation techniques, recording, and publishing as he went. Where his predecessors had focused on the grand and monumental, Petrie recognized the importance of ceramics and small finds. He pioneered seriation, using close study and comparison of ceramic typologies to establish chronological sequences for the material he excavated. This involved a significant element of statistical analysis, now an integral part of archaeological research but novel at the time, and allowed Petrie to create the first sequences for predynastic remains.

If Petrie's achievements are among the most important in the history of archaeology, Howard Carter's discovery of the tomb of Tutankhamun in 1922 is surely the most celebrated. Much of the modern close identification of archaeology with excavation can be explained by the enormous public reaction to this discovery, to the romance of opening a room sealed for thousands of years and Carter's first amazed glimpse of the "wonderful things" within. The accident of discovery and the glitter of treasure may not be the images archaeologists would most like associated with their work, but the hold on the popular imagination of Tutankhamun has an enormous positive aspect that cannot be overlooked: Carter's discovery remains probably the greatest single spur to public interest in archaeology and the ancient past.

The Near East

Since the Middle Ages, European travelers in Mesopotamia (the lands of the Tigris and Euphrates, incorporating all of Iraq as well as parts of Turkey and Syria) had described great ancient mounds, attached sometimes to biblical locations and narratives. Unlike the monuments of Egypt, however, these ruins were entirely nondescript: artificial hills (known in different areas by the terms tell, tepe, and höyük) offering no hint as to the original appearance of their contents. In the disappearance of Babylon and Nineveh, it was easy to see the fulfillment of biblical prophecy. At the beginning of the nineteenth century, the East India Company agent Claudius James Rich produced invaluable surveys of both, considering the mounds around Mosul (i.e., ancient Nineveh) and Hillah (Babylon) in light of classical accounts, but it was not until mid-century that large-scale excavation provided a fuller picture.

The excavations of Paul-Émile Botta and Austen Henry Layard at Assyrian sites in the 1840s brought forth a new and unfamiliar material culture. Each believed they had uncovered biblical Nineveh – Layard eventually did, though the site of Nimrud, the subject of his famous *Nineveh and its Remains*, was actually another Assyrian capital, Kalhu, while Botta's main work at Khorsabad revealed yet another, ancient Dur-Sharrukin. In large-scale excavations based on open trenches and tunneling, they uncovered vast palaces whose walls were lined with stone bas-reliefs. Excavation concentrated simply on the removal of these, cutting them away for transport to London and Paris. The imagery these reliefs contained was entirely new to the modern world: before Botta's excavations began in 1842, the few Mesopotamian antiquities known gave little hint of what lay beneath the mounds around Mosul. Assyria's kings and courtiers, wars, and hunts were displayed in intricate detail, though art historians of the day gave little credit to what they saw as a crude and barbarous form of sculpture.

The Assyrian excavations also recovered vast quantities of cuneiform texts, including the great library of the seventh century BCE king Ashurbanipal at Nineveh. As decipherment proceeded apace through the mid-nineteenth century and a distinct field of study, Assyriology, developed around these texts, so excavations, particularly in southern Iraq in the late nineteenth century, came to focus heavily on their recovery, often with little or no recording of context.

More systematic excavation did not come until the close of the nineteenth century, with the formation of the German Oriental Society and the beginning of major excavations at Babylon, from 1899, and Ashur, from 1903. These excavations were of a very different character to their predecessors, focusing on the tracing and recording of architecture. At Babylon, Robert Koldewey uncovered the palaces and temples of Nebuchadnezzar's capital, as well as the vivid glazed-brick reliefs of the Ishtar Gate, later to be reconstructed in Berlin. The excavations at Babylon and Ashur were recorded in far greater detail than their predecessors, and at Ashur, Walter Andrae's sounding at the Ishtar temple is generally considered the first stratigraphic excavation in Mesopotamian archaeology.

In Palestine, Flinders Petrie applied the same attention to detail that had brought him success in Egypt; his work at Tell el-Hesi in 1890 established pottery sequences and a chronological framework for excavation in the region. Even more important in this respect was the work of the American William Foxwell Albright, who through his own excavations in the 1920s and 1930s and study of

material from others established the ceramic chronology for Syria-Palestine. Albright is regarded as the founding figure in biblical archaeology, and his work has exerted an enormous influence on the discipline's development.

Aegean Prehistory

The history of archaeology is rich in romantic stories, but surely none can equal that of Heinrich Schliemann's discovery of Troy. Obsessed with Homer as a child, Schliemann had a highly successful business career and ultimately achieved great wealth. At the same time, he discovered a prodigious talent for languages. When he returned to the Iliad, he did so armed with this expertise, a fortune to spend, and above all, an unshakeable faith in the literal truth of Homer's account. His approach, seen at the time and since as shockingly naive, was to follow as closely as possible every detail of geographical description in the Iliad and thus to arrive at the walls of Troy itself. He quickly rejected the site favored by most authorities – judging it impossible that Achilles and Hector could have fought for three laps around it – eventually settling on the mound of Hisarlik (a site that had been previously suggested by Frank Calvert), where in the face of his successes, scholars' mockery was forced to give way to amazed disbelief. Better still, Schliemann was discovering something of tell formation, realizing that the mound he excavated had layers like an onion and that he was effectively digging through not one but many cities. The level of the mound he believed to represent Homeric Troy, and where he discovered the hoard of gold that will now be known forever as Priam's, was eventually found to be much later than the Bronze Age world of which the Iliad sings. In truth, the relationships of that world itself to its Homeric portrayal, of the siege of Troy to a historical event, or of any settlement at Hisarlik to the Ilium it describes remain distant. It is hard to begrudge Schliemann his prize, however: in the eyes of his contemporaries, he had done the seemingly impossible, and in the process opened up new worlds. As if this were not enough, he went on to excavate the royal tombs of Mycenae, here discovering a golden funerary mask he believed to have belonged to Agamemnon himself.

More methodical, though hardly mundane, were the excavations of Sir Arthur Evans at Knossos. Schliemann himself had wished to dig at Knossos, believing Crete to be the key to an early culture spanning the Aegean. Over 25 years of work on Crete, beginning in 1900, Evans was able to explore the potential Schliemann had glimpsed. And as Schliemann surely would have done, he saw in his discoveries at Knossos the palace of King Minos and the Labyrinth, the world of Theseus, Ariadne, and the Minotaur. Much of what Evans found was spectacular, most famously the colored wall paintings that survived in parts of the palace. Moreover, his discoveries confirmed not only interaction across the Aegean but also relationships more distant: Near Eastern imports and influence abounded. The Bronze Age world of which Knossos formed a part was a very large one, and the dynamics of travel, trade, and cultural interaction within it remain a major preoccupation of scholarship today.

The Americas

Antiquarianism and early excavation in the New World took a different path. The pre-Columbian Americas did not bear on European cultural history in the same way as the ancient Aegean or Near East. In Central and South America, whole empires were destroyed by European armies and diseases and subsequently all but forgotten, to the point that in the late eighteenth and nineteenth centuries it is accurate to speak of their "rediscovery" by scholars. In 1786, the ruins of Palenque were discovered, overgrown, and forgotten in the Guatemalan rainforest, though it was not until the mid-nineteenth century and the expedition of the American John Lloyd Stephens that these and other Mayan sites would be fully explored and brought to the world's attention. In South America, it was Alexander von Humboldt, primarily a naturalist, who produced the first drawings and descriptions of Inca roads and architecture. Further descriptions followed, but no excavation took place until 1862, when Ephraim George Squire, originally sent to Lima to represent the United States in a diplomatic dispute, spent 18 months surveying and digging in Peru

and Bolivia, in the process coming to recognize that the remains he was observing were not only Inca but also those of other, earlier societies.

Seeing cities and monumental architecture as marks of civilization, the eighteenth- and nineteenth-century commentators generally avoided associating the discoveries with the indigenous populations of the present, with alternative candidates including ancient European colonists, Phoenicians, Egyptians, Lost Tribes of Israel, and even a lost civilization of Atlantis. There were exceptions, including Stephens himself, but their views were unpopular and very slow to find general acceptance.

In North America too indigenous populations suffered greatly as European settlement expanded, though here, the most prominent sites were already ancient. Famously it was Thomas Jefferson who made the first systematic study of one of the great ancient mounds, near his home in Monticello, Virginia, in 1784. Following initial investigations near the surface, he cut a section through the mound, describing in order the strata of stones, earth, and bones contained within. Jefferson attributed the mounds to earlier Indian populations, though both this conclusion and the practice of systematically investigating the monuments came a full century ahead of their time. Again, an association of large-scale monuments with civilization and a racist reluctance to ascribe this to Indians led in the eighteenth and nineteenth centuries to alternative theories involving Phoenician, Egyptian, or Israelite settlers.

Throughout the Americas, the late nineteenth century saw the beginning of more systematic excavations. In Peru, Max Uhle's excavations at Pachacamac enabled the construction of pottery sequences and relative chronologies for the first time and helped to distinguish between the remains of the several distinct cultures whose remains the archaeologists encountered. This was crucial work, though more spectacular was Hiram Bingham's 1911 discovery of incredible Inca ruins at Machu Picchu, high in the Andes. In Central America, too, excavation helped to establish typologies and relative chronologies, Manuel Gamio's work in the early twentieth century providing sequences and clarifying chronological relationships. In North America, the study of ancient mounds became far more systematic in the 1880s, with Cyrus Thomas leading a program of survey, mapping, and excavation on behalf of the Smithsonian Institution's newly established Bureau of American Ethnology – and coming to agree with Jefferson's earlier view that the mounds were indeed the work of Indians. Meanwhile, scientific excavations were conducted at several mounds, including the Great Serpent Mound, Ohio, by Frederick Ward Putnam of Harvard's Peabody Museum.

Africa

As in the Americas, the early history of archaeology in Africa was profoundly and negatively shaped by racial theories. For much of the nineteenth century, sub-Saharan Africa was imagined to be an ahistorical wilderness, not only inaccessible to archaeologists but also certain to contain nothing of note. The eighteenth- and nineteenth-century European engagement with Africa was characterized by an enormous sense of cultural superiority on the part of the Europeans, whose own technologies gave them military superiority and reinforced the idea that the people they encountered were primitive and backward. Some textual evidence did exist of ancient civilizations, in awareness in classical texts of the undefined region called by Greeks, Ethiopia, in the works of medieval Arab geographers, and in the sixteenth-century account of Leo Africanus, one of the few Europeans at that date to have traveled extensively in the African interior. In the late eighteenth century, James Bruce, a Scot searching for the source of the Nile, encountered a substantial kingdom whose army contained what to European eyes appeared a clear African parallel to medieval knights: cavalry wearing mail armor and using lances, swords, and shields. At the time his account was generally disbelieved. Meanwhile the antiquities of Sudan, the focus of considerable nineteenth-century scholarly attention, were seen as part of the ancient Egyptian world, and therefore spectacular discoveries at the Kushite capital Meroë did little to affect the perception of "black Africa" as a wilderness.

Even early discoveries in Southern Africa had little effect. The ruins known as Great Zimbabwe,

apparently referred to as an inhabited site in sixteenth-century Portuguese accounts but rediscovered as a ruin by Karl Mauch in 1871, were generally identified with the Ophir to which King Solomon sent an expedition and recovered huge quantities of gold. Mauch himself felt that the identification solved a problem: since in his view the huge walls of Great Zimbabwe could not have been the work of Africans, it made sense to look to the possibility of Israelite or Phoenician builders. This was the general pattern of thought on the ruins for the rest of the nineteenth century, and although competing models emerged, all invoked foreign colonists or a now-vanished white indigenous population. Perhaps what is most noteworthy about this situation is that further excavation during this period *did* produce many artifacts with strong and obvious relationships to some still in use in the area, but even these did not in themselves change people's minds. Instead the obviously African artifacts were disregarded as later deposits, and it was not until the systematic excavations of David Randall-MacIver in 1905 revealed such material in context that a strong case was made for African builders. Even then, the identification was disputed for decades: in 1931, it was still necessary for Gertrude Caton-Thompson to argue forcibly that the ruins were of African construction.

India and East Asia

In India, the early focus was on description of standing monuments and the study of languages and literature, most prominently William Jones' work on Sanskrit. Throughout the nineteenth century, the study of Sanskrit, its several scripts, and vast literature remained of prime importance. Excavation was rare, although many sculptures and architectural elements were removed to collections, and some sent to Europe, including the remains of the Amaravati Stupa, now in the British Museum. Though many early descriptions exist – Robert Knox's enticing late seventeenth-century account of the ruins of Anuradhapura in Ceylon (Sri Lanka) coming as early as 1681 – more systematic study of monuments and sites only began with Alexander Cunningham, from 1861, the head of the newly formed Archaeological Survey of India. The Survey reported, mapped, and described ancient sites in northern and central India. Among Cunningham's discoveries was the site of Harappa, where he found a seal carrying an unknown script. Excavations at Harappa and Mohenjo-daro during the 1920s revealed an entire, previously unknown civilization based around the Indus and its tributaries, dating to the third millennium BCE and thus contemporary with the world of early Mesopotamian city states and the pyramid-building pharaohs of Old Kingdom Egypt. The script found on the Indus Valley seals remains undeciphered.

Where in India European, and particularly British, familiarity increased through settlement, trade, and the development of empire, East Asia was less well known, with China and Japan in particular extremely difficult for foreigners to access. It was not until the second half of the nineteenth century that Japan became at all accessible for foreigners. The first archaeological excavations to be conducted in the country were those of Edward Morse, working on Neolithic remains at Omori, in 1877. In China, the introduction of archaeology, alien to the country's own strong scholarly historical and antiquarian traditions, came even later. In the early twentieth century, Aurel Stein explored remote parts of Central Asia, recording sites, sometimes excavating, and – controversially – collecting artifacts and manuscripts. In 1920, Johan Gunnar Andersson was appointed by the Chinese government to investigate prehistoric remains, and in 1928, the Academia Sinica added an archaeological section to its Institute of History and Philology under the leadership of Li Chi, a US-trained anthropologist.

One early Chinese discovery of particular note was that of an unusual tooth, made by Andersson in 1920. He later found another, and a further example had been purchased by a doctor in 1899. Andersson gave the teeth he had found to Davidson Black of the Peking Union Medical College for study. Black concluded that they represented an extinct species closely related to modern humans, which he named *Sinanthropus pekinensis* – Peking Man. Subsequent excavations yielded many more specimens and vindicated the identification, and the species, further examples of which have been discovered across Africa, Europe, and Asia

(including Eugene Dubois' late-nineteenth-century discovery, then known as Java Man), is now known as *Homo erectus*.

Perhaps the most spectacular nineteenth-century discoveries in East Asia were the ruins of Angkor in Cambodia. In fact earlier accounts of the ruins did exist, but it was the 1864 description of Henri Mouhot that sparked more intensive interest. Crucially this interest included photographs and drawings, the former produced by J. Thompson and the latter by Louis Delaporte, through which images of these remote remains were disseminated around the world.

Oceania

As in the Americas, in Oceania archaeology developed in tandem with anthropology. The earliest excavations in Australia, however, resemble antiquarianism in Britain: explorations of mounds by Phillip in 1788 and Oxley in 1817. Perhaps more representative are early ethnographic efforts to record an Aboriginal culture that in the late nineteenth century was presumed to be on the verge of extinction, since by mid-century the impact of European colonization had decimated Aboriginal populations and disrupted social structures to a huge extent in many areas. This process included the collection of material culture, some remaining in Australia but much traveling to European collections. Some of the early collectors, such as Dermot Casey and H. M. Cooper, also located and recorded archaeological sites.

If the influence of European archaeology remained weak, this was in part due to a perception that its methodologies and focus, geared to identifying and categorizing long-term change in material culture, were inappropriate for the study of a culture seen as timeless: most Europeans considered Aboriginal societies as unchanging and locked in an early stage of human cultural development. Indeed, this was a major factor in nineteenth-century ethnographic interest, with Aboriginal societies being studied as literally Stone Age survivals by anthropologists such as Baldwin Spencer. The major work toward changing this view took place in the twentieth century, as the work of Norman Tindale and Herbert Hale at Ngaut Ngaut (then known as Devon Downs: as at a number of sites in Australia, the local community has more recently made efforts to see the site's traditional name reinstated in the literature) and Fred McCarthy at rockshelters near Sydney began to identify changing patterns in material culture over time in the manner of contemporary European and American work. All the practitioners of this period were amateurs, although Tindale and McCarthy both worked in association with state museums and their work was methodologically far more sophisticated than that of most of their peers.

Across Oceania, archaeology was secondary to ethnography, as Europeans attempted to record the living societies they encountered and to collect examples of their material culture. Some nineteenth-century research did relate to origins: Tasmanians were regarded as more "primitive" even than Australian Aborigines, primarily on the basis of tool types. In New Zealand, Walter Mantell's excavation at Awamoa in North Otago in 1852 revealed evidence of people who had hunted the moa, extinct by the time of European colonization. The moa's extinction and the latest of these remains were in fact of relatively recent origin, but the discovery sparked a debate throughout the late nineteenth century on the ancestors of the Maori and a much longer prehistory.

An interesting aspect of the search for origins, though one whose significance was not much discussed at the time, was the fact that, despite land claims to the contrary, European colonizers virtually never met with true *terra incognita*. At earlier stages, human beings had colonized almost every part of the planet, however remote. The great statues of Easter Island were first seen by a Dutch sailor, Jacob Roggeven, in 1722. The first excavations and surveys were conducted by German and American teams in the 1880s, and more detailed survey and study was conducted by Katherine Routledge in 1914–1915. Easter Island lies 3,500 km from the South American coast, and perhaps it is appropriate to finish this brief survey with the study of a location so distant from the world of the earliest antiquaries and excavators. European in its origins, archaeological investigation had come to span the globe.

Conclusion

By the early twentieth century, archaeological excavations were taking place all over the world. The practitioners remained largely European, however, and in order for this to change a further process of globalization was required. The twentieth century would see the development in many countries of strong national traditions of archaeological research and excavation, a change that would also come to affect the political resonances of major excavation projects. For much of the nineteenth and early twentieth centuries, archaeology's political connections had most often taken the form of cultural and territorial competition between European empires. As the twentieth century progressed, by contrast, excavations and ancient monuments would play a growing role in nationalist politics and the construction of national pasts. The excavation of ancient sites has enormous political utility, being by nature highly visible, strongly tied to a particular location, and able to address the distant, often prehistoric past in which national mythologies are frequently rooted. Beyond this, theories on culture, race, and ethnicity prevalent in the early and middle parts of the twentieth century would add another, at times sinister, facet to excavation's role in the construction of modern identities. At the same time, however, the global distribution of archaeological research and excavation projects had other, more cosmopolitan consequences. A wealth of new data and an international community of scholars facilitated the study of ancient connections and relationships that constantly crossed modern borders, demonstrating the impossibility of understanding any area's past in isolation. Associated developments include the emergence of broadly shared methodologies and theoretical frameworks for research, neither homogenous nor imposed by any single authority, but established and constantly debated as the result of a strengthening global academic (and increasingly also public) discourse. Ultimately, the worldwide spread of excavation over the course of the nineteenth and early twentieth centuries would create the conditions for what has since become perhaps the dominant conception of archaeology: as a collective, worldwide endeavor aiming to better understand humanity's interconnected, global past.

Cross-References

- ▶ Archaeology: The World at 1800–1850
- ▶ Global Archaeology
- ▶ Histories of the Archaeological Discipline: Issues to Consider
- ▶ Nationalism and Archaeology: Overview

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Early Iron Age Greece (c. 1150–700 BCE)

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State of Knowledge and Current Debates

The Chronological Framework

The period that extends from the Late Bronze Age until the Classical period, namely, from the middle of the eleventh to the early fifth century, is divided into subperiods: the so-called Protogeometric (1050–900 BCE), the Geometric (900–700 BCE), and the Archaic (700–480 BCE). The last phase of the Late Bronze Age – the twelfth century – which saw the destruction of the Mycenaean world is classified as Late Helladic III C (LH IIIC) and Late Minoan in Crete (LM IIIC). In some areas the ceramic production reveals a short period between LH IIIC and PG, known as Submycenaean (or Subminoan in Crete).

The Protogeometric Period (Eleventh and Tenth Centuries BCE)

The destruction of the Mycenaean palaces and the collapse of the Mycenaean civilization were followed by a period of great unrest. Extensive population movements on the Greek mainland, the islands, and the coast of Asia Minor gradually led to the formation of the geopolitical map of the historical era. The distribution of the Greek dialects is to some extent associated with these population movements.

The two centuries extending from 1125/1075 until 900 BCE are often termed "Dark Ages," on one hand due to the few extant archaeological remains and on the other because the period is characterized by the population decline, poor life standards, and the loss of literacy. Nowadays, this term, based on the current archaeological data, does not correspond to reality.

The fall of the Mycenaean palaces led to the loss of monumentality in architecture and the appearance of the apsidal huts and the disappearance of the palatial art (wall painting, use of precious metals and semiprecious stones, fine-decorated pottery) as well as of the Linear B script, since they did not have to serve the developed Mycenaean system of bureaucracy any longer. During the same period, new burial customs appear, while iron became the dominant material. The reasons that led to the replacement of copper with iron are not fully understood, although one of them may have been the shortage of available resources.

The continuity or discontinuity from the Bronze to the Iron Age constitutes a major scholarly issue. Only in Crete is a continuity in cult obvious from one period to the other, while in mainland Greece such cases are few and mostly isolated (for instance, at Ay. Irini on Keos or at Kalapodi in Phocis) (LEMOS 2002).

Settlements and Sanctuaries: Society, Economy, Religion

Building Materials and Techniques

The domestic architecture of Early Iron Age Greece (1100–700 BCE) is characterized by detached buildings of various plans (apsidal, oval, round, and rectangular), built of ephemeral materials with the exception of the base of the wall that was usually formed of stones (see Drerup 1969; Fagerström 1988; Mazarakis Ainian 1997). In some areas, however, houses were built entirely of stone and each unit usually consisted of two or more chambers. The use of mud brick for the superstructure of the walls was common, although pisé or wattle and daub was occasionally applied, too. Archaeological excavation has amply demonstrated the widespread use of timber in the architecture of the period. Pitched roofs projecting over the sides and sometimes supported by a stoa of vertical posts protected

the exterior sides of the walls from the weather conditions and secured the roof. The contemporary small building models allow us to gain a fairly good idea of the external appearance of the buildings. In regions where timber and/or mud brick was not available or, on the contrary, in lands where stones were easily at hand, as, for example, in the Cyclades and on Crete, curvilinear plans do not occur often. It is not a coincidence that in these places flat roofs dominated. There, as well as in northern Greece, the settlements were densely nucleated, presumably because the space was limited due either to the presence of a circuit or defensive wall or to the topography of the site. The compact arrangement may have also been conditioned by the need for defense: when the settlement was unfortified, the exterior walls of the houses on the periphery of the village provided an elementary line of defense. The need for protection from the fierce winds which blow in the Aegean and from the high summer temperatures must have also constituted a factor which conditioned the densely packed form of settlements throughout the centuries as well as the small dimensions of the windows.

Society and the Form of Houses

In general, within settlements and inhabited areas, the dwellings of ordinary people can be distinguished from those of the wealthier or ruling members of the society. From an architectural point of view, the dimensions and the complexity of design are the distinguishing features. During the Protogeometric period, these differences are more pronounced but they become less evident throughout time. The political organization and the social stratification of the Early Iron Age communities are therefore reflected in this differentiation. But what can we infer about the political organization of the period between c. 1100 and 700 BCE?

What Kind of Leaders?

Soon after the destruction or decline of the Mycenaean administrative centers, Greece was segmented into petty kingdoms. It is generally believed that the *qa-si-re-u* (*basileus*) mentioned in the Linear B tablets was a rather unimportant official, perhaps the chief of a semi-independent provincial town or village who, following the collapse of central authority, succeeded the *wanax* and managed to consolidate his power. These local rulers, who may have also held priestly duties, would have gained their independence after the upheavals of the end of the Late Bronze Age and therefore assumed the leadership of self-sustained communities from local governors.

In the Homeric epics *basileis* are mentioned, but it is not clear whether they should be regarded as highborn leaders who held the right to rule on a hereditary basis or whether they held power due to their competence and personal wealth ("Big Man" system). A third alternative could be the so-called "chiefdom" model that stands in between the two, since power is vested in the chief on a hereditary basis but he is constantly challenged by peers. Gradually, however, especially from the middle of the eighth century BCE onwards, these leaders would have "given way to a system of collegial rule by a land-owning nobility," to use Walter Donlan's words (Donlan 1985). This transition would have occurred peacefully in some places, while in others following civil strife.

The So-Called "Dark Ages" or the "Age of Heroes"?

The Homeric *oikos*, according to Donlan, is "the basic kinship, residential, and economic unit, comprising both the house (dwelling, land, animals) and the household. The household consists of the family (often an extended family of three generations) plus servants and adopted members" (Donlan 1985).

The evidence so far recovered suggests that in the beginning of the first millennium BCE, communities lived in nucleated settlements or in loosely organized villages, a pattern which does not contradict the Homeric scheme. Nevertheless, the large mid-tenth century BCE apsidal building at Toumba-Lefkandi, in Euboea, stands out as an exception to this general rule, since it lies outside the actual settlement, which was situated on the plateau of Xeropolis (Coulton et al. 1993). This unparalleled monumental edifice, measuring c. 45 by 10 m, is among the few structures of the period divided into more than three compartments. It was built of stone up to a height of 1 m, while the rest of

the superstructure was of mud bricks. The shallow porch was followed by a roughly square compartment divided into two parts by a row of posts. Next came a spacious room, doubtless the main hall of the unit; at one corner there was a staircase leading to an attic beneath the pitched roof. This main room, which was also provided with a side doorway, communicated through a central corridor on either side of which there were two roughly square small chambers with the rear apsidal storage compartment (numerous cavities to receive pithoi were found). The edifice was covered by a high-pitched roof composed of perishable materials and supported by an axial wooden colonnade and a series of wooden posts set against the walls as well as a veranda of wooden posts (a "peristyle"). In the center of the main compartment, an exceptionally rich couple had been buried according to a "Homeric" manner: the warrior was cremated and his ashes placed in a bronze amphora, accompanied with his weapons; his female consort was buried next to him, adorned with precious jewels; in an adjacent pit lay the four horses of the warrior. It is probable that this was the "royal" couple of Lefkandi, buried within their "anaktoron." Alternatively, this may have been a funerary monument, a large-scale replica of their actual residence, which may have been situated elsewhere, perhaps on the neighboring promontory of Xeropolis occupied during the period of use of the Toumba building (a comparable though smaller "megaron," roughly of the same period, was excavated recently on Xeropolis). If the former hypothesis is retained, it could be argued that the ruler and the members of his entourage, during the mid-tenth century BCE, lived apart from the rest of the community. The fact that the Toumba building was used for one generation only and the area henceforth served as a rich burial ground of their descendents could favor in this specific case, James Whitley's model of "unstable settlement system," i.e., places occupied for a relatively short period due to the fact that authority is unstable (Whitley 1991). The building itself is a reflection of a chiefdom-based organization of the society, in which the ruler wishes to manifest his right to rule.

The other dwellings of the nobility of the Protogeometric period are not so impressive, but the differences in scale and design regarding the dwellings of the common people are fairly clear (in general see Mazarakis Ainian 1997). Not a few exceed 15 m in length and they are often divided into several compartments in a row, the one behind the other. It seems that the social, economic, and religious duties of the ruler dictated the basic prerequisites of the dwellings of the governing elite. There exists no exact parallel to the Lefkandi building in Early Iron Age architecture; the closest, although loose analogies may be drawn to, are Megaron B at Thermon, in Aetolia, and certain apsidal buildings from central and northern Greece. At Mitrou in East Locris, an apsidal building, contemporary to the one from Lefkandi, must have been the residence of an important family. At Halos in Thessaly several storage pithoi were found in situ in the apse of the edifice there. The large apsidal unit unearthed at Toumba (Thessaloniki) consisted of four (and subsequently five) rooms one behind the other and comprised numerous dependencies. Contemporary apsidal buildings such as Unit IV-1 at Nichoria, Unit 74 L-M at Asine, and Building A at Koukounaries (Paros) or rectangular Building T at Tiryns, dated to the twelfth century BCE, as well as several Cretan examples could be also identified as houses of the governing elite. Most of these dwellings were occupied for several generations, suggesting either some kind of hereditary leadership, although a long-lasting chiefdom model cannot be excluded. The Nichoria building, in the southwestern Peloponnese, is among the most interesting: it yielded rather rich metallic finds and presents a complex architectural layout, a pit hearth and a raised round platform in the main room, and significant storage facilities in the apse, something which has been taken as evidence that the house served communal, religious, and economic functions as well.

Normal houses of the same period were as a rule rather humble structures, provided with one single room and occasionally a porch and a back chamber. The basic daily indoor activities of the household were presumably concentrated in the same space. As typical examples one may mention some curvilinear huts at Nichoria and Asine and an oval hut at Old Smyrna.

Cult Buildings

The older cult buildings of the Early Iron Age have been found in suburban or extra-urban sanctuaries. At Ay. Irini on Keos, cult activities continue uninterrupted within the partly reused Late Bronze Age cult building. A clay head from a prehistoric statue was reused as a cult image of Dionysus in the eighth century BCE and was positioned on a cylindrical clay base. An impressive succession of cult buildings from the Late Bronze to the Early Iron Age is currently unearthed at Kalapodi in Phocis. Such uninterrupted cult continuity is widespread on Crete, especially in sacred caves and rural sanctuaries, while one of the earliest temples has been found at Kommos (temple A); it was in use from the late eleventh century up to the ninth century BCE, when it was replaced by a similar temple, B. The temple housed ritual meals. Likewise, a very early apsidal cult building, associated with burnt sacrifices, was excavated at Poseidi in the Chalkidike peninsula, which later became the suburban sanctuary of the Eretrian colony of Mende.

Burial Customs

Burial customs (Morris 1987; Whitley 1991; Lemos 2002) differ from area to area. Single burials and cremations represent common characteristics, while tumuli, bronze urns, and tomb markers are only found in specific areas. The practice of cremation might have been introduced from the East. It was firstly established in Attica, Crete, Rhodes, and the Cyclades (Naxos) and only later spread throughout the Greek world.

The Submycenaean Period (1200–1050 BCE)

During the Submycenaean period (Desborough 1964), single inhumations in cist graves appear in Athens, unlike the multiple burials in chamber and tholos "family" tombs which characterized the previous Mycenaean era. The *necropoleis* of the Kerameikos and Salamis are the most important for the period. The reuse of chamber and tholos tombs is detected in central Greece, the Peloponnese, and Crete.

The deceased were placed inside the grave either in an extended or in a contracted position. In exceptional cases, the dead are cremated and the ash remains placed inside an urn. Rectangular shaft graves appear towards the end of the period. Earthen tumuli could cover single burials in Epirus, Thessaly, and Euboea. The grave offerings are most often poor, consisting of clay vessels and occasionally bronze jewelry, while weapons are absent. Grave markers are not known, but low mounds cover some graves in the Kerameikos. The tumuli, known from north and northwestern Greece, appear also in the south towards the end of the twelfth century BCE.

The Protogeometric Period (1050–900 BCE)

The cremation employed for the adult population was adopted in Attica during the tenth century BCE and remained the dominant practice for the next 300 years, even though inhumations were not completely absent. The reuse of Mycenaean chamber and tholos tombs or the continuation of erecting such tombs is attested in Thessaly, Achaea, Messene, and Crete.

The richest burial evidence for the period comes from Athens. The cremation took place outside the grave and the ash and bone remains were placed inside an urn. Neck-handled amphorae were usually used for men and belly-handled amphorae for women. During the early tenth century, mounds covered the burials, while during its second half, an unworked rectangular stone or another vessel was used as the marker. Iron objects and weapons were now also included among the grave offerings.

Art

Pottery

The Submycenaean period saw the production of basic types of storage (amphorae and lekythoi) or table vessels (skyphoi, cups, oinochoes), decorated with simple linear patterns. The few figural scenes come from Crete and Cyprus. The use of the multiple brush might be placed in this era. The most numerous ceramic finds come from Athens, Salamis, and Lefkandi.

Around the middle of the eleventh century, the emergence of the Protogeometric style reflects the potters' and painters' will to apply a mathematical balance between shape and decoration. Basic

geometric motives are applied with the multiple brush and the compass. The burials of the Kerameikos in Athens were rich in Protogeometric finds. Amphorae, oinochoes, jugs, kraters, skyphoi, kantharoi, kalathoi, and pyxides form the shape repertoire of this period. Wavy lines and zigzags, concentric circles, and semicircles are the basic decorative motives. Isolated horses are the only exceptional figures occurring on vases. Due to trade contacts, Cypriot influences can be traced.

One of the most important settlements of the Protogeometric period is Lefkandi in Euboea. Around the middle of the tenth century BCE, deep skyphoi decorated with pairs of pendent concentric semicircles will become the trademark of the Euboean presence especially in the eastern Mediterranean. The type is found in Thessaly and Macedonia, where the Euboeans later established colonies (e.g., Methone, Mende, Torone). It is still found in the middle of the eighth century reflecting a prolonged PG stylistic phase that is contemporary with the Attic Early and Middle Geometric. The Attic Protogeometric style is also found in the Peloponnese as well as in the eastern Aegean. Crete retains older shapes, often decorated with figured scenes.

The PG style which was retained in the Corinthia until 875 BCE and in Thessaly and the North Cyclades until the middle of the ninth century or in Euboea, Achaea, Elis, Messenia, Laconia, Phocis, and Locris until 750 BCE is known as "sub-Protogeometric" (in general see Lemos 2002).

Sculpture

Figurines of humans, horses, and bovines are dedicated at major sanctuaries during this period, such as at Olympia and Samos. Two of the most important examples in terracotta come from burials: a deer from the Kerameikos and a centaur from Lefkandi. Both have wheel-made cylindrical bodies and rich linear decoration.

The Geometric Period (Ninth and Eighth Centuries BCE)

The ninth and eighth centuries BCE mark a period of important developments and changes, which become more obvious after the middle of the eighth century, which is often referred to as a period of "Renaissance." According to a widespread opinion, that century saw a kind of "revolution" with the overthrow of the old aristocratic model and its replacement by the "isonomy" of the polis. From a cultural perspective, this century is associated with the reintroduction of images or other artistic developments which have been forgotten since the fall of the Mycenaean palaces.

A demographic rise followed by the amelioration of life conditions, the development of agriculture and farming, a boost in pottery and metal production, and the rise of a class of traders which will allow the exit from the isolation and the renewal of contacts with the Mediterranean world with the foundation of colonies in the Northern Aegean, in South Italy, and Sicily can be placed in this era. The eighth century BCE also saw the development of monumental architecture and the intensification of cult activities at sanctuaries. The introduction of the alphabet and the spread of the Homeric epics belong here too. All these developments led to the birth of the polis.

Settlements and Sanctuaries: Society, Economy, Religion

The Geometric Period (900–700 BCE): From the Age of the Heroes to the Rise of the Polis

During the following two centuries (ninth–eighth centuries BCE), as the power and wealth of the lower and especially the middle classes rose, the flagrant differences between houses of members of the elite and those of the common people gradually fade out. Differences in the houses of the governing and nongoverning elite cannot be traced. The case of the settlement of Zagora on Andros is characteristic. There the dwellings of the elite, situated in the central part of the settlement, are all equivalent in size and design, with the exception of Unit H19 and its dependencies which are slightly better furnished with a more prominent location; next is the central open space of the settlement in close proximity to the hypaethral sanctuary of the community. On the other hand, there still exists a dividing line between the houses of the elite and the middle classes, though this difference is not very pronounced (i.e., Quarter D-H as opposed to J). In other Aegean

settlements, the social stratification is more difficult to discern. Nevertheless, in most places, it is still possible to spot a possible ruler's dwelling as at Emporio on Chios (the so-called Megaron Hall which lies alone inside the fortified acropolis, while the houses occupy the slopes of the hill), at Koukounaries (Building C), at Nichoria (Unit IV-5), or at Lathouriza (Unit I-IV).

Usually, aristocratic dwellings of the ninth and eighth centuries BCE were fairly long and narrow buildings of apsidal or rectangular plan which comprised at least a porch and a main room. Oval buildings were as a rule more modest structures unfit to serve as residences of the elite and therefore reserved for dwellings of the middle and lower classes as well as for workshops. Some buildings of this category, however, were more spacious and divided into two or three rooms (Building Θ at Oropos, Building A at Viglatouri in Euboea, Building IV at Antissa on Mytilene). The finds usually attest that in the latter cases we are also dealing with houses of wealthier individuals or with cult buildings. On the other hand, round buildings were apparently not considered fit to serve as dwellings; they usually have small dimensions and were reserved either for storage (i.e., Old Smyrna, Xeropolis-Lefkandi) or for industrial activities (i.e., Oropos) and exceptionally for cult activities (i.e., Oropos and Lathouriza).

One of the best-explored settlements of the Geometric period is Oropos, in northeast Attica, which may be identified with Homeric Graia (*Il.* 2, 498). Buildings of all types have been identified. Most of them belong to the Late Geometric period. The finds in the Central Quarter of the settlement attest that one of the main activities of the community was metalworking. The largest buildings there, Θ, which underwent three remodelings (oval–apsidal–oval), and perhaps oval building B, were presumably dwellings of members of the elite, who were managing these activities. The former presumably served communal needs as well and seems to have housed certain religious activities too. Various enclosure walls divide the architectural units into sectors. These *periboloi* probably served to define the limits of semiautonomous households within the community. From the evidence at hand, it is likely that the community here was organized according to well-defined family units, which may be compared to the Homeric *oikos* such as that of Odysseus. Each *oikos* unit would have consisted of a number of buildings surrounded by an enclosure wall (Homer's *erkos*, *Il.* 9.476; *Od.* 22.442). A family unit would have consisted of one or more dwellings, workshops, storage facilities, animal pens, and occasionally a household shrine. Analogies can be drawn with the Homeric Megaron, the *erkos* which is built around it, the dung heaps inside the courtyard due to the fact that animals were kept within it (*Il.* 24.163; *Od.* 17.297), the altar of Zeus within the *erkos* (*Od.* 22.334-335), associated perhaps with the practice of libations (*Il.* 16. 231; 24. 306), the enigmatic *tholos* (*Od.* 22.442-474), the chambers (*thalamoi*) which do not form part of the main megaron (2.6.242-250; *Od.* 1.425; 4.718, 802; 23.192), and the *laure* (*Od.* 22.136-138, 162-166) which could represent the narrow corridors formed between the various architectural units and the *periboloi*.

Thanks to the Oropos discoveries, it is today possible to reassess the evidence from a number of sites. The pattern, i.e., clusters of curvilinear buildings surrounded by enclosure walls, may be observed in other contemporary settlements, especially within the Euboean milieu. At Eretria, for instance, which lies opposite Oropos, as a rule, curvilinear buildings were also enclosed within *periboloi*. This remark is applicable to the area of the sanctuary of Apollo Daphnephoros as well. Some of these served to protect the buildings from the surrounding river and torrents. Others, on the other hand, seem to have delimited spaces and properties. This, in relation to the absence of clear votive offerings associated with these earlier structures, could lead one to suggest that the area of the sanctuary of Apollo was originally an aristocratic habitation quarter, which later on became the seat of the poliad divinity. The phenomenon of sanctuaries encroaching upon old residential areas was fairly common in antiquity.

A similar organization may be observed in the eighth century BCE at Viglatouri, in East Euboea (perhaps to be identified with Euboean Kymi), Xeropolis-Lefkandi, Old Smyrna, and elsewhere. It could be even argued that Athens (e.g., the

evidence deriving from the area of the future Agora) was organized in a similar manner during the Geometric period. It should be noted that in several of the above mentioned sites, we observe the custom of burying infants and children in close proximity to the *oikos*, outside the enclosed space.

Thanks to the architectural layout of the compounds described above, the separation of individuals and their activities would have thus become possible. On the basis of the archaeological evidence, one could suggest that each household under consideration had a significant degree of economic autonomy and probably in some instances going beyond self-sufficiency.

Building Θ at Oropos as well as certain buildings at Eretria and a large oval building at Viglatouri may have served for "Homeric" symposia and for the entertaining of guests, or even for other social occasions, which could be clearly separated from normal everyday activities. As argued earlier, cult activities would have been also performed within the *oikos*. Some were directed towards venerable ancestors. Certain cults were later on appropriated by the *polis*, for instance, that of the heroon by the West Gate at Eretria or even that of Apollo Daphnephoros, while others fell into oblivion together with the families which performed these cults, as at Oropos.

From the House of the Heroes to the House of the Citizens

It is usually argued that until the mid-eighth century, families in central Greece would have often lived in one-room houses that could not have afforded much privacy. This, however, presupposes that each house consisted of a single architectural unit, something not always obvious. In the earlier Dark Ages, restricted space would have allowed neither the separation of various activities nor the physical separation of the members of the *oikos*, although we can point out notable exceptions, such as the so-called "heroon" at Toumba-Lefkandi and to a lesser degree Unit IV-1 at Nichoria, which present complex plans and secondary entrances. In such buildings, during the tenth century, several functions (political, economic, religious) appear to have been gathered under the same roof. By the eighth century, the same functions were concealed within the same enclosed space, although each activity or group of activities was performed in a separate building or area.

The model of *oikoi* surrounded by *periboloi* was seemingly associated with curvilinear buildings or single-roomed structures. However, one can also detect a similar social organization in areas where rectangular forms prevailed. For instance, at Megara Hyblaia the *periboloi*, as well as streets, presumably delimitated the *cleroi* from the public space. In areas where agglutinative units were the norm, the social organization may not have differed significantly. For example, the houses at Zagora originally consisted of one main room and a porch, serving a variety of functions and developed later on into multi-roomed courtyard houses, with differentiated functions. We may witness here the beginnings of the process which led to the control over social contact, which characterizes the Classical period onwards. Multi-roomed houses were not necessarily of the courtyard type. At the Early Archaic settlement of Lathouriza in Attica, for instance, several chambers belonging to the same important unit (Unit I-IV, perhaps a leader's dwelling) have separate doorways and do not communicate with one another.

It is a fact that towards the end of the eighth century BCE, more complex rectangular house plans, consisting of several rooms clustered around a courtyard, as at Zagora, or opening onto a common corridor or courtyard, as at Eleusis and Thorikos in Attica, Corinth, and Dreros (Crete), appear. These buildings, predecessors of the courtyard or *pastas* houses of the Archaic period, mark a decisive step forward in house planning. Indeed, the amelioration of living standards, the social behavior of the head of the house, the position of the woman in the household, the presence of servants and the need of intimacy, as well as the diversification of the household activities led, towards the end of the eighth century, to the construction of more complex houses, which comprised more rooms, each of which had a specific function. The older tradition of rooms set one behind the other was gradually abandoned both due to the unpractical nature of the design (one has to cross a number of rooms in order to reach

the back of the house) and the social constraints of the new era. Thus, it was now essential that each house should possess a separate dining room (the future *andron*), a kitchen and a room, which sometimes may have been the same which was designed for the preparation of food, where women would pass most of their time. In continental Greece, the "long house," the origins of which may be sought in the technical limitations faced by the earlier architects, was finally replaced by the "wide house," which was more practical, comfortable, and better aerated. Moreover, the more square form of the new type of house was doubtless more appropriate for town planning. This design reached continental and east Greece later than the areas where dense construction had been the norm throughout the centuries, as in Crete or the Cyclades, and was applied from the beginning in the western colonies (with the exception of the earliest, Pithekoussai), where social and emotional restrictions were easier to surpass.

In conclusion, from the single elongated house of the Protogeometric period, composed of one or more rooms set the one behind the other, which afforded limited privacy, we pass to the complex *oikos* formed by several freestanding structures organized within an enclosed space and finally, from the early seventh century onwards, to the multi-roomed house articulated around a central courtyard or of the *pastas* type. The reasons for the gradual disappearance of curvilinear plans are varied: among these already mentioned and related to social, economic, religious, and political changes, one could add the technical advances of the builders (including the reinvention of roof tiles) and the rise of the *polis* which resulted in population growth within urban centers and inevitably led to a new management of space. The huts of the Age of the Heroes were practically everywhere replaced by rectangular multi-roomed houses but were sometimes preserved as relics of the past which were remembered down to Roman times (Vitr. *Arch*. 2.1.5).

The Birth of the Panhellenic Sanctuaries and the Ancient Greek Temple

Until the middle of the eighth century BCE, "rural" sanctuaries were in the open-air, while the cult buildings of the extra-urban sanctuaries seem to have been of small dimensions. The Panhellenic sanctuaries of Olympia (*Il*. 2.519; *Od*. 8.79-81, 11.581, 697-701), Delos (*Od*. 6.162-167), and Dodona (*Il*. 16.233-235; *Od*. 14.327-328, 19.296-297) are echoed in the epics. The ash altar of Zeus in Olympia formed the center of cult activity (Paus. 5.13.8-11). The sanctuaries, which have been founded in neutral areas, such as Delphi, Delos, and Dodona, were mostly visited by the contemporary elites that employed them as arenas of competition and ostentation. The traditional date of the first Olympiad (776 BCE) can partly reflect the reality of the official establishment of the games. The first temple of Apollo on Delos is considered a simple rectangular building, similar to others which came to light in smaller sanctuaries of the Geometric era, like the Heraion of Perachora or the sanctuary of Athena Alea at Tegea, and must have served for the protection of valuable offerings to the cult statue of the deity. At Kommos on Crete, the presence of hearths and the numbers of animal bones, mollusks, drinking and eating vessels, as well as iron spits from the interior and the exterior of the temple indicate the organization of banquets.

The first monumental temples appear towards the end of the eighth century BCE. A Late Geometric monumental temple was detected in the extra-urban sanctuary of Iria on Naxos. Its interior is divided into four naves by three rows of wooden columns. The presence of a hearth and benches along the side walls, as well as the burnt and unburned animal bones, attests to sacrifices and ritual banquets taking place inside the temple.

The first "hekatompedon" (meaning 100-ft long) temples appear towards the end of the eighth century. In the Heraion of Samos, a series of altars has been detected, the earlier of which has been placed to the end of the ninth century, while the first hekatompedon was constructed one century later. A stone base for the cult statue is found inside the temple. In the rural sanctuary of Artemis in Rakita (Ano Mazaraki) of Achaea, a Late Geometric apsidal hekatompedon temple with an unusual apsidal peristasis was found, where the wooden columns did not rest on the stylobate. The temple of Apollo at Corinth was built with dressed

blocks and was covered with terracotta roof tiles. The fist securely identified peripteral Corinthian temple was constructed one generation later in Isthmia at the sanctuary of Poseidon. The peripteral temple of the Argive Heraion is based on a terrace, founded on a strong terrace wall, which, according to its pseudo-cyclopean masonry, can be dated to c. 700 BCE. The chosen masonry might reflect the will of the Argive people to emphasize their own heroic ancestry.

The peristasis becomes one of the main characteristics of the Greek temple. The question is whether it first appeared in the northeastern Peloponnese or in Ionia or whether its origin can be related to some common source. It seems that it was not a homogeneous phenomenon. The origin of the Ionian peristasis should be sought in the East, while that of the northern Peloponnesian in Egypt, which could have also provided the inspiration for the Doric order of architecture. Indeed, beneath the temple of Artemis at Ephesus, built by Croesus, the remains of an older peripteral temple of the Early Archaic period have come to light. The interior columns, as well as those of the peristasis, were made prior to the temple walls, suggesting that they might have aimed at its protection from the weather conditions. The peristasis of the heroon at Lefkandi, dating two centuries earlier, might have had a purely functional role. The above examples prove that the peristasis has its roots in domestic architecture. How and why this functional element of Greek monumental architecture acquired a symbolic character that limited its use to temples remains an open question.

Burial Customs

Athens and Attica

Early Geometric, Middle Geometric I (Ninth Century BCE) During the ninth century BCE, burial customs do not present serious differences from those of the Protogeometric era. The *necropoleis* are small and there are many isolated burials. Cremation continues to characterize adult burials. Rectangular, roughly worked slabs, often coexisting with large amphorae and kraters with their undersides having been pierced for offering libations, are used as grave markers. The ninth century saw an increase in the quantity of jewelry placed inside the graves as well as of objects denoting contacts with the Near East. The social status is determined by the quality and not the quantity of the objects. Child burials are almost absent. The few Early Geometric I examples were, however, very richly furnished. This phenomenon cannot be associated with the reduced mortality rate, but with the exclusion of children from the mortuary record (Morris 1987). It has been rightly claimed that the core of the Athenian aristocracy is a product of this century.

Middle Geometric II and Late Geometric Periods (Eighth Century BCE)

(a) *MG II and LG I Periods (800–735 BCE):* During the second quarter of the eighth century, adult inhumation reappears, although cremation was not abandoned. Adults and adolescents were now buried in shaft or cist graves, while infants and small children were deposited inside vessels. Cremation was preferred for adult males and the ash remains tended to be placed in an amphora or a bronze cauldron (lebes). Markers were set over both inhumation and cremation tombs. Rich female burials are a characteristic feature of this period.

(b) *LG II Period (735–700 BCE.):* Practically all burials were inhumations in shaft graves. Cremations were few and in the majority of the cases, the ash remains were placed inside a bronze cauldron (lebes). The number of the burials increases sharply, while child burials are reintroduced. No grave markers are known. Large vessels are now placed inside the grave as offerings, while metal offerings are absent. At this time the first offering trenches appear in the Kerameikos, where ashes, burnt, and broken vases have been found.

The Other Areas of Greece

Outside Attica, inhumation in general prevails. The same *necropoleis* have been used continuously since the Protogeometric period. The Mycenaean tradition of inhumation in family tholoi, or

more rarely in chamber tombs, continues in Thessaly, Achaea, and Messenia. In Halos (Thessaly), primary cremations, covered by soil mounds, are common. Mounds of this type cover individual burials elsewhere, too (Vergina in Macedonia, Vranezi in Boeotia). In some areas of the Argolid, pithoi are used for adult burials. In Corinth organized cemeteries appear c. 770 BCE. During the Late Geometric period, cist graves gradually replace shaft graves.

A great variety in mortuary practices may be observed in the Cyclades. On Thera, a few metal urns are known as well as two eighth century BCE tripods. Two stone *stelae* with figural decoration in relief dating to c. 700 BCE are known from Paros and Kimolos. In Crete the cremation inside family chamber, or more rarely tholos, tombs remains the predominant practice. The ashes are placed inside a clay urn. In Eastern Crete, inhumations inside tholos tombs or even in caves prevail. Some of the Cretan tombs contain spits, a tradition also attested in the Argolid and Cyprus.

"Homeric" Burials and Hero Cults

Under the term "Homeric Burials," we consider the various funerary practices which seem to follow closely the Homeric descriptions (for instance, *Il*. books 18 and 23 and *Il*. 7.417-432; *Od*. 11.218-222 & 12.11-15) regarding the exceptional honors offered during the burial ceremony towards important individuals, leaders, or warriors. "Homeric" burials are known from Euboea (Lefkandi, Eretria), Crete (Eleftherna), Pithekoussai, and Cuma in the West and Salamis in Cyprus. The customs include the cremation of the dead and the placement of their ashes inside a metal urn, the sacrifices of horses, dogs, and occasionally servants, as well as the tumulus (*sema*). The case of the so-called heroon at Toumba/Lefkandi stands out. There, in the first half of the tenth century BCE, a powerful individual had achieved prominence during his lifetime and was remembered by the living for more than a century after his death: his descendents buried him, together with his female consort, in the middle of his *anaktoron* and subsequently raised a mound over his ruined dwelling, and they chose as a burial ground the area in front of the former entrance of the house. Yet, neither sacrifices nor ritual offerings were made in honor of the deceased. A huge krater that was found in the central room, next to the burial shafts, appears to have been a cultic vase, but it was presumably used only for the funerary ceremony and afterwards left behind and buried beneath the tumulus. An oversized bronze tripod by the entrance of the building, of which only the traces in the rock for the placement of its feet have been preserved, may have been positioned there after the burial ceremony, but presumably as a status symbol, rather than a cultic utensil for the performance of rituals. It seems, therefore, that the Homeric burial customs preceded by several centuries the recording of the epics.

The phenomenon of Hero Cult appears during the second half of the eighth century BCE. Such cults can be divided into three broad categories: (1) tomb cults at prehistoric tombs (mainly Mycenaean chamber and tholos tombs); (2) cults in the honor of recently heroized deceased (including hero-founders of new settlements and colonies); and (3) cults of eponymous heroes from the epic and mythic cycles.

The first category concerns chamber and tholos tombs of the Mycenaean period which were opened during the eighth century BCE in order to offer some cult in honor of the deceased. Characteristic examples are the cults at the tholos and chamber tombs at Georgiko (Thessaly), Orchomenos and Thebes (Boeotia), Menidi and Thorikos (Attica), Solygeia, Mycenae, Argos, and all over Messenia in the Peloponnese. At Eleusis an enclosure wall constructed in the Geometric period over a group of Middle Helladic burials was identified as a *temenos* of the Seven against Thebes mentioned by Pausanias (1.39.2).

In the second category, we may include sites such as Lefkandi, Grotta (Naxos), Paros, Eretria, and Eleusis. In all these cases, we witness the offering of exceptional honors at the graves of prominent individuals.

Lastly, during the eighth century BCE, we witness the foundation of sanctuaries dedicated to the worship of heroes from the epic or mythic cycles, such as the shrines of Odysseus in the Polis cave in Ithaca (*Od*. 8.390-391 και 13, 13-14), of

Agamemnon at Mycenae, of Menelaus at Therapne near Sparta, of Phrontis at Sounion, of Pelops at Olympia, and of Herakles in Thebes.

Long ago, it was suggested that the rise of hero cults in the Late Geometric period was partly due to the spread of the Homeric epics (J.N. Coldstream). It has been also argued that hero cults preceded the circulation of the Homeric epics and functioned independently. Since it is today widely accepted that the Homeric epics were not conceived in the eighth century, but were transmitted orally from generation to generation throughout the Dark Ages, it is more likely that the rise of hero cults is not an unrelated phenomenon. By Late Geometric times, a period during which the epics would have reached a wider audience, their impact in the shaping of these cults would have been even more significant. However, the rise of hero cults towards the end of the eighth century BCE has received numerous other explanations, too. According to one opinion, they could be regarded as one of the consequences of the shift from a pastoral into an agricultural economy: the small but free landowners who were threatened by the new elite were trying to establish connections with their estates through tracing their ownership of land to legendary ancestors (A. Snodgrass). Alternatively, competition for landownership as a cause for the rise of hero cults may be viewed through another prism: the landowners could have been the aristocrats themselves who felt that their estates were threatened by the lower social classes (J. Whitley). Hero cults may also be explained as one of the means through which the expanding body of the leading aristocracy managed to contain the reaction of the previous governing elite in order to enable a peaceful transition of the institutions of the rising polis (C. Bérard).

Art

Pottery

The Attic Geometric pottery production is divided into three periods: early (EG I: 900–875, EG II: 875–850 BCE.), middle (MG I: 850–800, MG II: 800–760 BCE), and late (LG I: 760–735, LG II: 735–700 BCE). The decoration includes a variety of Geometric motifs, while the shapes are now symmetrical. The vertical axis of the vases is emphasized, while the glazed areas are limited and followed by the inclusion of decorative motifs on the entire surface. The circular motives of the Protogeometric era yield their place to Geometric motifs, like the meander. Horse figurines also appear. New shapes are now introduced. The Middle Geometric period saw the introduction of the cylindrical pyxis with its handle being formed by horse figurines. In addition to horses, more animals and birds also enter the repertoire at this stage. Towards the end of the period, the first figural scenes appear. *Prothesis* (the laying out of the deceased), *ekphora* (the funeral procession from house to tomb), and battles on land and sea are the main subjects (Haug 2012). This period forms the peak of the Geometric expression: symmetrical Geometric motives and figural scenes and accuracy in the decoration are all hallmarks of the artistry of the period.

During the Late Geometric period, prosperity is reflected in the ceramic production, which tends to express monumentality. The known vases that come from Attic *necropoleis* were either placed inside the grave or used as markers. For the first time, the vases can be assigned to particular painters or workshops, which are given conventional names. The Dipylon Painter is considered the main artistic personality of the Late Geometric period. He has been ascribed a number of monumental shapes used as grave markers.

The second phase of the Late Geometric period is characterized by the decline of the style with the Geometric motifs being carelessly applied. Large shapes are no longer produced; the shapes are slimmer and plastic snakes occur on the rim, the shoulder, and the handles. Outline appears along with silhouette. The repertory of scenes is now enriched: chariot processions, riders, warriors, mourners, dance scenes, battles, hunting, and ritual scenes appear as well as scenes which have been considered as the earliest mythological representations. The presence of heraldically placed animals and monsters is announcing the Orientalizing character of seventh century BCE vase painting.

The Geometric style is a Panhellenic artistic expression which has been undoubtedly based on the Attic Geometric production. Euboea, with

Eretria, Chalcis, and Lefkandi, forms a prominent center. The Corinthian shapes are the first that travel in the Western Mediterranean. The Early proto-Corinthian production coincides with the Attic Late Geometric II and it is mostly composed of small perfume containers decorated with Orientalizing motifs (in general, see Coldstream 2008).

Sculpture

The small-scale sculpture follows the Geometric structure, while the repertory is enriched. The main axis of the figurines is emphasized. The development of their features is clear in the series of Attic clay horses from Early to Late Geometric with their volume gradually declining and their parts becoming more clearly defined. The human figurines follow the same development. Clay chariots, wheels, and pomegranates are known from this period, too.

Bronze figurines follow the same lines of development. Bronze horses are common, either being made individually or set on a perforated base or as attachments of tripod handles. The Argive, Corinthian, and Laconian workshops are the most prominent. Bulls, dogs, deer, and birds are also made. The Attic, Argive, and Corinthian workshops produce a good number of bronze human figurines as well. Warriors, flute or lyre players, archers, as well as groups, such as dogs attacking a deer, charioteers, and men with centaurs, are included in the eighth century production.

Objects of more precious materials are rare. The ivory female figurines from the Kerameikos are unique and point to Eastern prototypes, which can be sought in the Syrian representations of Astarte.

Metalworking

The introduction and the widespread use of iron characterize the early historical period. Weapons and tools are made of iron, while bronze is still widely used for objects, like jewelry, tripods, and weapons, which are also offered in the great sanctuaries after a victory. The knowledge of metalworking technology came from the East and was adopted by the peoples of the Aegean area. Bronze objects were cast in appropriately shaped casts and hammered, while details were formed by incision.

The origin of objects destined to support bronze vessels can be sought in the East and Cyprus. The freestanding rod-tripods consisted of a cast rim to which three legs were attached. They appear in the Greek world during the Protogeometric period (Crete) and continue to be produced during the Geometric (Crete, Athens, Thera). A second type of stand was formed by a square part attached to four legs, which often had wheels and a richly decorated rim. Most of the known examples come from Cyprus and Crete, although they also come from Delphi and Rhodes. A third related item is the bronze cauldron (lebes) with three attached legs and two disc-handles vertically attached to the rim. In the Late Geometric period, horses and charioteers are attached to the handles, while the legs bear linear decoration or figural scenes. These vessels have been known since the Mycenaean era as household equipment but later acquired a ritual use until they served as highly esteemed votives in the Greek sanctuaries or were offered as contest prizes during the Geometric period. The movable bronze cauldrons with animal protome attachments are of an eastern origin and they are hammered and made of a thin bronze sheet. The earliest date to the eighth century BCE.

Jewelry and Dress Ornaments

Diadems, made of thin golden electrum or silver strips, bearing incised or impressed linear or figural decoration are prominent during the Geometric era. They served as grave offerings. Examples come from Attica, Euboea, Skyros, Crete, and Rhodes.

Golden spirals have formed the most widespread type of earrings since the Protogeometric period. During the first half of the ninth century, new techniques and decorative themes are imported from the Near East. The earrings from the grave of the "Rich Athenian Lady" of the Areopagus are excellent examples of craftsmanship, possibly made by an eastern artist working in Athens (Smithson 1968). Geometric earrings are known from Attica, Patras, Delos, Boeotia, Corinth, Euboea, Lemnos, and Crete. Necklaces often of faience beads, rings, and bracelets are common.

Pins are the main types of dress ornaments. Their emergence is related to the new Doric

peplos. Attica, Argos, and Corinth are the main centers of production. The earliest fibulae can be traced back to the Mycenaean period, but they were widely used during the historic era. The plaque of the fibulae was often decorated with incised geometric motifs or figural scenes. During the end of the eighth and the seventh centuries, Boeotia is the most important production center of fibulae. The type of the spectacle fibula, possibly of northern origin, is found in a number of areas until the sixth century.

Weapons

The widespread use of iron during the Early Iron Age is obvious in the construction of weapons, since the material was now stronger and lighter. The sword and the spear are the main types of offensive weapons. The main type of sword (Naue II) appears around the end of the Mycenaean period and is retained until the Orientalizing period. The metal heads of the spears have been made of iron since the eleventh century. Yet, the finds from the main sanctuaries (Olympia, Delphi, Lindos on Rhodes) indicate that bronze spearheads continued to be produced during the Geometric period. The defensive equipment included the shield, the helmet, the cuirass, and the greaves. Round shields prevail, often with a central hump or an animal protome. The most characteristic examples come from Crete and date to the eighth century. A Late Geometric grave from Argos preserved the complete equipment of a warrior: the helmet and the cuirass are the only complete examples of this period. The earliest examples of greaves come from Crete and belong to the end of the eighth century BCE.

Mythological and Epic Scenes in Geometric Art

With its figural decoration, the Dipylon amphora marks a new era for Greek art, since for the first time in Attica after the fall of the Mycenaean palaces, human and animal figures coexist with linear motifs. Thereafter dynamic figural scenes enter the pottery repertoire while also decorating other objects, like tripods and fibulae.

Since 730 BCE, a number of figural scenes have been related to mythological or epic scenes, while individual persons have been identified as particular heroes (Snodgrass 1998). The Siamese twins, Actoriones or Moliones, mentioned by Homer and Hesiod, have been recognized on a number of Late Geometric vase scenes. Herakles killing the Stymphalian birds or struggling with the Nemean lion appears on Boeotian fibulae and an Athenian clay support. On the leg of a bronze tripod of the last quarter of the eighth century, two men are fighting over a tripod, a scene suggesting the struggle of Herakles with Apollo for the possession of the Delphic tripod. Individual centaurs have been interpreted as Typheus, Chiron, or Nessos. Ariadne and Theseus is one of the suggestions for the male and female figure depicted on an Attic louterion today in the British Museum, shown ready to embark on a boat. The scene on an Attic oenochoe, today in Munich, might point to Odysseus' wreck.

The poems of the Epic Cycle include all the incidents that took place before and after the Trojan War. Scenes referring to these epics appear around 700 BCE. The scene of a male figure ready to kill an Amazon on a clay shield from Tiryns has been interpreted as the struggle of Achilles and Penthesilea known from the *Aithiopis*. The Trojan horse is depicted on a Boeotian fibula of 700 BCE, while the most detailed and well-known representation of the fall of Troy decorates the neck of a monumental relief pithos from the Cyclades dating to 675 BCE.

The epic or mythological interpretation of these scenes is ambiguous and it remains a matter of scholarly debate. The scenes have a general character and they do not closely follow the preserved versions of the myths and epics. Time and space are not denoted, while the way that the figures are depicted – lacking any inscriptions – does not allow for their secure identification. The best artists of this period, however, seem to have been influenced by their contemporary developments and attempted to portray the narratives known to them with the available media. During the next century, mythical scenes can be more easily recognized with the aid of inscriptions, too.

The emergence of mythological scenes can be associated with the developments taking place during the second half of the eighth century. At that time, seafarers and traders actively participate

in the colonization of the western Mediterranean, and Panhellenic sanctuaries are established, the alphabet comes into use, epic poems acquire their written form, and the polis rises. The elites associated themselves with the glorious epic past and the epic heroes. The intensification of contacts with the East must have seriously contributed to the development of the narrative scenes. Imported precious objects, the adoption of new subjects and techniques, brought a new era to the Geometric repertoire, preparing the grounds for the Orientalizing phenomenon of the seventh century BCE.

Conclusion

The Birth of the Alphabet It is generally accepted that the Greek borrowed their alphabet (Powell 1991) from the Phoenicians and modified it in order to include vocalic sounds (Herodotus refers to the *phoinikeia grammata*, "Phoenician letters" [5.58.1-2]). Although the introduction of the alphabet has been firstly placed between c. 1100 and 750 BCE, today most scholars, based on older inscriptions and the comparison of the letters' forms with their Phoenician counterparts, do not accept a date much earlier than c. 800 BCE.

From the almost 100 Greek inscriptions which date before 650 BCE, one half belong securely to the second half of the eighth century, while only very few can be dated prior to 775 BCE. The earliest and most abundant examples of Greek script come from geographical areas with a Euboean presence, like Lefkandi, Eretria, Oropos, Methone, the Cyclades (Zagora on Andros, Grotta on Naxos), Al Mina in Syria (Euboean emporion of the ninth century), Italian Cumae, and Pithekoussai. The two oldest inscriptions come from Italy. The first was inscribed on a local vase, coming from the grave of a local woman in the cemetery of Osteria dell'Osa near Gabii in Latium, Italy (c. 800–775 BCE), and it includes five Greek letters (ΕΥΛΙΝ) which cannot be interpreted (Eileithyia, the protector of parturition and childbirth is characterized as *Εὐλινος*, weaving well by Pausanias 8.21.3) (Watkins 1995). Two Greek letters (A, X) were inscribed on a funerary urn from Bologna, dating to the first half of the eighth century. The inscribers might have been Greek visitors, Euboean pre-colonists.

Other inscriptions dating to the second half of the eighth century and the early seventh come from the sanctuary of Zeus Ombrios on Mt. Hymettos, the Acropolis of Athens, the Athenian Agora, Aegina, Boeotia, Kalapodi, Delphi, Corinth, Epidaurus, Kleonai, Thera, Amorgos, Anaphi, Syros, Rhodes, Kalymnos, Samos, Old Smyrna, Phaistos, Syracuse, and Selinus.

An inscription in dactylic hexameter is found on an oinochoe from the Dipylon cemetery in Athens. It dates to c. 740 BCE and reads:

> hος νυν ορχεστων παντων αταλωτατα παιζει τοτοδε κ(μ)μ(ν;)ν. . .
> (who, among the dancers, who dances most gracefully. . .)

An interesting three-verse inscription comes from Pithekoussai from the cremation of a young boy of c. 12–14 years of age. It is inscribed on a Rhodian kotyle of c. 720 BCE. The alphabet is Euboean, and the last two verses are in dactylic hexameter:

> Νεστορος: ε[ψ]ι: ευποτ[ον]: ποτεριον
> hος δ αν τοδε πιεσι: ποτερι[ο]: αυτικα κενον
> hιμερος αιρεσει: καλιστε[φα]νο: Αφροδιτες
> (Nestor's cup I am, good to drink from.
> Whoever drinks this cup empty, straightaway
> the desire of beautiful-crowned Aphrodite will seize)

Both texts must have been created during a symposion. It was a common practice for its partakers to recite a verse each, which led finally to the creation of a sarcastic or funny poem. Whether the father of the boy was named Nestor or the inscription points to the famous cup of the Homeric king remains an open question (cf. *Il.* 11.632-635).

The harmonious coexistence of Greeks and Phoenicians and their common aims suggests that the adoption of the alphabet must have taken place at a place where they both met. It has been suggested that mixed marriages might have led to the development of bilingual families that led to the invention of the alphabet. In the Greek world, there are Aramaic, Neo-Hittite, Phoenician, and Cypriot inscriptions. An inscribed bronze phiale from a tomb of c. 900 BCE from Knossos and a fragment of

800 BCE from Eretria preserve the earliest evidence. Other examples of the eighth century were found at Pithekoussai, Eretria, Kisamos on Crete, and Tragana (ancient Opountian Locroi).

Where can the adoption of the alphabet be placed? The idea that it took place along the Syro-Palestinian coast, possibly at the *emporion* of Al Mina, where a Euboean community has existed since the end of the ninth century, remains credible. Cyprus must have played an important role in the spread of the alphabet, where indigenous populations were living together with Phoenicians and Greeks. This assumption however can be supported only with difficulty, since Greek inscriptions appear much later on the island. Moreover, although part of the population has used Greek language since the eleventh century, they employed a different script, the Cypro-syllabic. The supporters of the theory of the spread of the alphabet from the Doric islands (Crete, Thera, Rhodes) accept that the alphabet went through different stages of evolution before acquiring its final form, and therefore they suggest that the letters φ, χ, and ψ were firstly missing, as shown from inscriptions from Phaistos and Thera. Attica belongs to the candidates that adopted the alphabet since close contacts with the Phoenicians can already be traced from the ninth century. Euboea remains the strongest possibility, since not only the majority but also the earliest inscriptions come from areas where Euboean communities existed. The recent discovery of a large number of graffiti at the Euboean colony of Methoni, in the Thermaic gulf, where Phoenician pottery has been noted as well, will doubtless lead towards a better understanding of the birth of the alphabet. The assumption that the alphabet first appeared in Boeotia and from there spread to the West has been recently strengthened by the finds from Oropos. The date of the establishment of Pithekoussai in 775 BCE suggests that the alphabet did not move from the East to West but that it must have been brought by the Euboeans from the West.

The adoption of the alphabet by the Greeks has been mostly related to the financial-trading needs in a private and public level. In contrast to the complicated Mycenaean script, only known among the scribes, none of the first texts of the historical era belong to the category of state archives or financial texts. On the other hand, it is worth noting that most of the early inscriptions on vases denote their owner. Therefore it has been claimed that the adoption of the script is closely related to the need to state ownership. However, philologists claim that the reason lies to the need to record oral poetry in dactylic hexameter. Except for the above mentioned examples, inscriptions of this kind dating to the second half of the eighth and the first quarter of the seventh come from Aetos on Ithaca, the Athenian Acropolis, the sanctuary of Zeus on Mt. Hymettos, Eretria, Corinth, Amorgos, Phaistos, and elsewhere. The known inscriptions verify that the Greeks have known how to read and write since the latter part of the eighth century BCE.

Trade and Colonization

Even though the fall of the Mycenaean civilization led to the decline of the contacts with the neighboring cultures, the maritime routes were not forgotten (Boardman 1980; Ridgway 1984; Tandy 1997). In some areas these contacts remained active during the eleventh and tenth centuries. These intensified from the ninth century onwards due to the general improvement of living conditions. All transactions have been further supported by the use of the alphabet since the first half of the eighth century. The Phoenicians are mentioned by Homer as "ναυσίκλυτοι" traders who circulated "αθύρματα", valuable objects. Until the middle of the ninth century, the Greek exports to the coast of the eastern Mediterranean littoral are exclusively Euboeans and remain strong until the end of the eighth century, when Greeks of different areas appear, too. The contacts with the Near Eastern world were reciprocal, as indicated by the gift exchange between Greeks (mainly Euboeans) with the Eastern cultures. Many of these objects were finally dedicated at the Greek sanctuaries.

The Phoenician expansion in the Mediterranean begins with the establishment of Kition on Cyprus around the middle of the ninth century and theoretically reaches its end with the foundation of Carthage towards the end of the century.

Phoenician smiths, goldsmiths, perfume-makers settled on Crete, the Dodecanese, Attica, and Euboea. The Euboeans followed parallel paths with the Phoenicians to the West, and a small group of Easterners, maybe Phoenician, mingled with the Euboean community of Pithekoussai. Recent discoveries attest to the presence of Phoenician pottery in the Northern Aegean as well, namely, at the Eretrian colony of Methone.

Finds from Sant'Imbenia in Sardinia testify to the cooperation of Euboeans and Phoenicians around 800 BCE. The mix of traders and artisans with the local populations had an important impact on the cultural developments of the early first millennium BCE. The colonization and the maritime explorations served as a source of inspiration for the *Odyssey* of Homer. The adventures of Odysseus are not simply a narration of an heroic sea voyage, but a mix of various incidents of different periods.

Warfare

If the Trojan War can be considered as the final war of the Bronze Age, the famous Lelantine war, which historians and archaeologists place in the eighth century or the early seventh century BCE, is the most crucial war of the period under examination. Chalcidians faced the Eretrians with many Greek cities taking the part of the one or the other polis. The discovery of a "polyandrion" at Parikia on Paros, dated at the end of the eighth century BCE and containing the funerary urns of c. 160 young males, cremated and buried at the same time together, could reflect an episode of this war. The prince of grave 6 of Eretria might have been killed during one of the battles, like Amphidamas from Chalcis. The fact that Hesiod participated in a poetic competition during the burial of the latter and he was actually awarded a tripod provides a safe dating of the war around 700 BCE (*Works and Days* 65ff.). The destruction of Lefkandi slightly earlier than the end of the eighth century and the discovery of a Late Geometric cup filled with gold buried beneath the floor of a house at Eretria have been considered as overtones of this war. The narration of the achievements of the Trojan heroes can be placed within the frame of the aristocratic competition among Chalcidians and Eretrians, the *hippeis* (cavalry) and the *hippobotai* (horse owners), respectively. The first Messenian war, which concerned the effort of the Spartans to occupy Messenia, can be also placed in the eighth century. The settlement of Nichoria was destroyed by fire in the middle of the eighth century and subsequently abandoned. This catastrophe might be relevant to this war.

Sociopolitical Organization

The "Transitional" period saw the rearrangement of the social and political power in the wider Greek world as well as the establishment of a new class of rulers which seem to have embodied the characteristics of the Big Men or chiefs of the primitive societies (see above). The importance of the symposion as a manner of social behavior in the Classical era is well known. The Homeric epics, as well as the excavation results, indicate that the origin of the symposion should be sought in the period under examination.

The Birth of the Polis

According to Thucydides, the citizens constitute the polis (7.77.7), while for Aristotle, the polis is a community of people characterized by political organization (*Pol*. 1252β 30, 1280β 33). The polis consists of public and private buildings as well as the land and the people. The polis is a state that is named after its citizens' ethnic identity (e.g., not "Athens" but "the polis of the Athenians"). The agora, the public buildings, and the urban temple dedicated to the protector deity are some of the basic characteristics of the polis. In the *Iliad*, the notion of the polis does not seem widespread. In contrast, temples, *agorai*, and public buildings are mentioned in the *Odyssey*. The combination of all these characteristics can be detected only in a few excavated settlements, although this may be due to the partial investigation of most sites.

The presence of a temple dedicated to the worship of the protector deity is conceived as one of the main characteristics of the polis of the historical period. The first urban temples dating to the eighth century are often adjacent to aristocratic dwellings, where the members of the local elite participated in meals offered by the local ruler (Mazarakis Ainian 1997). At the same

time, suburban sanctuaries are found in close or larger proximity to settlements, some of which gradually acquired Panhellenic prestige, like Olympia, Delphi, and Delos. There were also rural sanctuaries, which attracted the inhabitants of a wider area without being connected with a specific settlement. The oldest cult buildings belong to the extra-urban or rural sanctuaries, which often seem to have served for the organization of ritual dinners. The settlements which did not acquire urban temples did not develop into autonomous poleis. At that time, many settlements were abandoned, maybe due to the phenomenon of *synoikismos* (Snodgrass 1971).

The foundation of urban or suburban hekatompedon temples, as well as the construction of fortifications, was the result of communal decisions rather than individual initiatives. Towards the end of the Geometric period, the temples acquire a different architectural form, while at the same time various buildings, like the treasuries and the *hestiatoria* (dining rooms), are erected, in order to satisfy the different purposes that the temples no longer served. Hero cults were spreading from the middle of the eighth century BCE, a phenomenon linked, as already mentioned with the birth of the polis (Antonaccio 1995).

Although not necessary, a main feature of the ancient Greek polis was its fortification wall. After the fall of the Mycenaean civilization and until around 800 BCE, with very few exceptions, the settlements of the Greek mainland were unfortified or loosely organized villages. The fortified settlements reappear in the early eighth century but do not constitute the norm before the end of it. This is due to the fact that in many settlements the earlier walls of the Late Bronze Age were still in use. In north Greece and Crete fortified settlements are common, while other social groups settled in naturally protected sites.

The hoplite revolution, the formation of the hoplites into a phalanx, marked the birth of the polis. Every hoplite does not behave as an individual, since with his shield he protects the hoplite that stood to his left. The hoplites act as a single "person". The hoplite equipment that was found in a grave at Argos (730–720 BCE) offers a *terminus post quem* for the chronology of the new tactic. A well-known passage from the *Iliad* indicates that Homer understood the tactics of the phalanx (*Il*. 13.130-133).

The spread of the Homeric epics since the second half of the eighth century combined with the tendency towards the redefinition of the identity of the new social groups led to a number of innovations, such as the reintroduction of the narrative scenes in vase painting or novel behaviors, like the phenomenon of the hero cults or the aristocratic burials of Homeric type (Snodgrass 1998; Langdon 2008).

The seventh century is a period of social restructuring during which the lower social classes of traders and seafarers acquired wealth. This led to the reevaluation of the political and social organization and the codification of the laws, thus strengthening the institutions of the polis. At the same time, the communal sense of competition as well as of individuality were developed, as indicated by the development of monumental architecture and sculpture, lyric poetry, ownership inscriptions, regional variations of the Greek alphabet, and local workshops.

Cross-References

- ▶ Agora in the Greek World
- ▶ Andron
- ▶ Ceramics, Ancient Greek
- ▶ Classical (Greek) Archaeology
- ▶ Crete, Archaeology of
- ▶ Cross-Cultural Interaction in the Greek World: Culture Contact Issues and Theories
- ▶ Cyprus, Archaeology of
- ▶ Emporion
- ▶ Greek Colonialism, Archaeology of
- ▶ Greek Houses, Archaeology of
- ▶ Greek Islands (Excluding Crete), Archaeology of
- ▶ Oral Tradition: Ancient Greece
- ▶ Orientalizing Phenomenon: Greek Archaeology Perspective
- ▶ Panhellenism
- ▶ Religion, Greek, Archaeology of
- ▶ Stoa
- ▶ Tombs, Greek (Iron Age)

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Early Iron Age India

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Prelude

The advent of iron technology was a major breakthrough in the history of mankind. It changed the earlier face of lithic-based culture and led to great changes in the sociocultural and economic conditions of early societies. The iron technology period may vary from region to region, but the metallurgy and utility of iron changed the entire scenario of early societies. Early smelting methodologies, though primitive and crude, are the basis of technological development. During the iron technology period, many new trends evolved for the first time in the Indian subcontinent, as well as in other areas. Such trends included settlements with permanent structures, the use of metals and metallurgy, the development of various crafts, the beginnings of large-scale commercial-based production, the use of inter- and intra-regional contacts, and the evolution of sociocultural systems and religious faith. So many developments occurred which changed the entire scenario of the early lithic-based culture to a sophisticated way of life throughout the Indian subcontinent, and many cultural trends have prevailed up to the present.

Recent observations from archaeological excavations in India, along with the present author's studies in southern India—which are not only reported for the first time but also include some findings that are new to the records of archaeology—are presented in this volume. For the convenience of understanding, the reported data are discussed under various headings, including Technological Evolution, Memorializing the Dead and Rituals, Settlement Patterns, and Time Frames. Further, to understand the sociocultural systems that developed during the Early Iron Age, the material culture of this Age in India is also discussed under various subheadings, including bloomery and crucible smelting methods, discussed under the heading Technological Evolution; while different types of memorial structures, ceramic types, and other antiquities are discussed under the heading Memorializing the Dead and Rituals. Settlements and dwellings and ethnological data are also discussed.

Dispersal and Extraction of Metal

Iron is found in the environment in almost all geographical zones in India. It always appears in combination with other elements (usually oxygen or sulfur) in rocks, excluding meteorites and native iron, which have limited archaeological significance. When a rock contains enough iron for it to be profitable for us to attempt to use it to create iron, the rock is referred to as an ore. Lithic users of early societies realized the potential of iron and started to work on the ore. The easy accessibility of the ore in India and its strong and lustrous character attracted humans, and iron, a better metal that is harder than copper, gradually replaced other sources for making tools and weapons. In India, there is evidence in several localities to indicate that the Iron Age had started by the end of the second millennium BCE or a little earlier (Chakrabarti 1974, 1992).

India is one of the richest sources of iron ore deposits in Asia. Moreover, the iron ore reserves are easily accessible and of high grade. Further, the ore is good for smelting because it has few impurities such as phosphorus and sulfur. Hematite (Fe_2O_3) is a commonly available mineral ore, colored black to silver-gray, brown to reddish-brown, or red. It is mined as the main ore of iron. Hematite is harder than pure iron, but is much more brittle. Though huge deposits are concentrated in a few selected pockets, other deposits are distributed throughout the country. Centers where the production of good quality steel (corrosion-resistant iron), made by the technique of melting the ore in a crucible, have been reported from different pockets in southern India. The primacy of iron technology in the Indian subcontinent is well established, and several scholars have investigated the state of ancient Indian iron technology (Neogi 1914; Chakrabarti 1992; Biswas 1996; Tripathi 2001; Balasubramaniam 2002). The metallurgy of iron and steel in ancient India, which

includes the extraction of iron, the working of iron, and other salient features of ancient Indian iron technology, has been studied very well. Further, some objects illustrating the skill of the Indian blacksmiths provide ample information about Indian technological development; for example, the Delhi iron pillar, made in illustrates the skills of blacksmiths in India.

The substantial iron ore deposits in India helped the tremendous growth of the iron industry and technologies were developed by the smiths in India. The technology required to separate iron from its ores and convert it into durable and useful objects is far more complicated than that needed to work successfully with metals in general and particularly Iron. Smiths working with metallic iron have developed technologies throughout the Indian subcontinent.

The direct reduction method of iron extraction was used for a fairly long period in India's history. It may be noted that not only does iron melt at a higher temperature than copper, but also that iron oxide holds its oxygen atoms much more tenaciously. A temperature of about 2020 °F (wrought iron, 1482–1593 C; gray cast iron, 1127–1204 C) is required to cause iron to melt sufficiently so that it will flow.

Early Iron Working

The actual evidence of archaeometallurgy from sites in north and central India is very sparse; at sites such as Raja Nal-ka-tila (c. 1400 cal. BCE), Malhar (c. 1800 cal. BCE), and Atranjikhera (1265–1000 cal. BCE) in Uttar Pradesh, and Noh (885–580 cal. BCE) in Rajasthan (Agrawal and Kharakwal 2003; Chakrabarti 1992; Gaur 1983; Possehl 1989; Tewari 2003). In the Gangetic region, a study tracing urbanization in the Allahabad district (from c. 1000 BCE to 300 CE) reported slag at a few sites, with a very limited number of iron artifacts (Erdosy 1988). However, it is very difficult to ascertain details about local production from the available reports.

Early Iron Age sites such as Malhar, Raja Nal-ka-tila, Baba Wali Pahari, and Dadupur in north and central India have been excavated (Tewari 2003). Evidence at those excavations, such as tuyeres, heaps of slag, and finished iron artifacts, is related to smelting (Tewari 2003). Tewari (2003) suggested three sets of dates during which iron working was being practiced at these sites. They are c. 1200–900 cal. BCE, c. 1400–1200 cal. BCE, and c. 1800–1500 cal. BCE. In this context, the date range of 1550–1300 uncal. BCE for iron artifacts from the Megalithic phase at Gufkral in Kashmir is worth mentioning (Sharma 1992: 67). Allchin and Allchin (1993: 345) and Gaur (1997: 20; 1983: 15) proposed a date of c. 1200–1000 cal. BCE for iron working in the mid-Ganga Valley, and Chakrabarti (1977: 183) also suggested a similar date, of c. 1270 cal. BCE, for iron working there.

It may be noted that the Uttarakhand region in the Central Himalayan graves was older than those in Swat by obtaining new dates from the site of Bageshwar ranging between c. 2666 and 2562 cal. BCE (Agrawal et al. 1995: 251). Painted gray ware (PGW) pottery has also been reported in the Purola and Thapli areas of the Central Himalayan region (Khanduri et al. 1998). Further, in the Kumaon and Almora districts in the Central Himalayan region slag and crucibles have been reported. The slag from the Uleni site at Dwarahat in the Almora District has been dated as early in the first millennium BCE (c. 1022–826 BCE) (Agrawal and Kharakwal 1998: 252, 263; Singh 2008: 245); these investigators suggested that the people of the Ganga Valley most likely procured iron ore (which is locally available), or processed iron in the shape of artifacts from the Central Himalayan region. Agrawal and Kharakwal (2003) believed the Central Himalayan region played an important part in the diffusion of iron metallurgy in the Ganga Valley, primarily because they argued that the Ganga Valley itself is a foredeep filled with alluvium and without any mineral outcrops (Agrawal and Kharakwal 2003: 252–253).

Technological Evolution

The early iron technology landscape in India can be characterized as having seen different waves of evolution and growth in India. Iron metallurgy in India gradually evolved over centuries, from slag-

rich simple wrought iron to corrosion-resistant iron and steel. By the end of the last millennium BCE, smiths in India had developed iron metallurgy and mastered the large-scale production and preparation of both heavy weapons and sharp-edged weapons in corrosion-free iron. Such techniques were prevalent in India for a long time and promoted long-distance trading. It may be noted that, by the end of the last millennium BCE, Indian swords were popular among most of the early societies in general and particularly in the Mediterranean region. Early smelting methods reported from archaeological evidence are discussed in the following sections. Metallurgical development in the Indian subcontinent appeared in three different stages:

I. Bloomery iron
   Smelting and forging
II. From wrought iron to steel
   Carburization – accidental and/or deliberate
   Quenching and tempering
III. Crucible iron or Wootz steel

Bloomery or Bloomary Forge

The bloomery forge was the earliest form of smelter capable of smelting iron. A bloomery is a type of furnace once widely used for smelting iron from its oxides. A bloomery's product is a porous mass of iron and slag called a bloom (an iron bloom). The mix of slag and iron in the bloom is termed sponge iron, which is usually consolidated (shingled) and further forged into wrought iron. The bloomery has now largely been superseded by the blast furnace, which produces pig iron. Tripathi (2001) has discussed various aspects of the construction and operation of ancient Indian iron furnaces.

Different designs for iron extraction furnaces have been described in the literature. The heights of these furnaces ranged between 1.5 to 3 m. A typical ancient Indian bloomery furnace can be schematically compared with a modern blast furnace. Bellows placed at the bottom of the furnace were operated at a controlled rate. The iron ore had to be reduced in order to obtain the iron. Iron ore is essentially oxide of iron and it is reduced by the carbon monoxide (CO) that is produced by the burning of charcoal in the bloomery furnace (or coking coal in a modern blast furnace). Other, unwanted, oxides, such as silicon dioxide (SiO_2), which is commonly found in iron ores, have to be removed, and this was made possible by the creation of a liquid slag called iron silicate or fayalite ($FeSiO_4$ or $2FeO{\bullet}SiO_2$). While some of the liquid slag flowed out of the bloomery furnace during the reduction of iron ore to iron, some of the liquid slag still remained when the hot iron lumps were taken out of the furnace.

A bloomery consists of a pit or chimney with heat-resistant walls made of earth, clay, or stone. Near the bottom, one or more pipes (made of clay or metal) enter through the side walls. These pipes, called tuyères, allow air to enter the furnace, either by natural draughts or forced with bellows or a trompe. An opening at the bottom of the bloomery may be used to remove the bloom, or the bloomery can be tipped over and the bloom removed from the top.

The first step to be taken before the bloomery can be used is the preparation of charcoal and the iron ore. The charcoal is produced by heating wood to produce the nearly pure carbon fuel needed for the smelting process. The ore is broken into small pieces and usually roasted in a fire to remove any moisture. Any large impurity in the ore can be crushed and removed. Since slag from previous blooms may have a high iron content, it can also be broken up and recycled into the bloomery with the new ore.

In operation, the bloomery is preheated by burning charcoal, and, once it is hot, iron ore and additional charcoal are introduced through the top, in a roughly one-to-one ratio. Inside the furnace, carbon monoxide from the incomplete combustion of the charcoal reduces the iron oxides in the ore to metallic iron, without melting the ore; this allows the bloomery to operate at lower temperatures than the melting temperature of the ore. As the desired product of a bloomery is iron, which is easily forgeable, a low carbon content is required. The temperature and the ratio of charcoal to iron ore must be carefully controlled to

keep the iron from absorbing too much carbon and thus becoming unforgeable. Cast iron occurs when the iron melts and absorbs 2% to 4% carbon. Because the bloomery is self-fluxing, the addition of limestone is not required to form a slag (Killick and Gordon 1989; Pleiner 1971).

The small particles of iron produced in this way fall to the bottom of the furnace, where they combine with molten slag, which often consists of fayalite and iron mixed with other impurities from the ore. The mixed iron and slag cool to form a spongy mass referred to as the bloom. Because the bloom is highly porous, and its open spaces are full of slag, the bloom must later be reheated and beaten with a hammer to drive the molten slag out of it. Iron treated this way is said to be wrought (worked), and the resulting iron, with reduced amounts of slag, is called wrought iron or bar iron. It is also possible to produce blooms coated in steel by manipulating the charge and air flows to the bloomery.

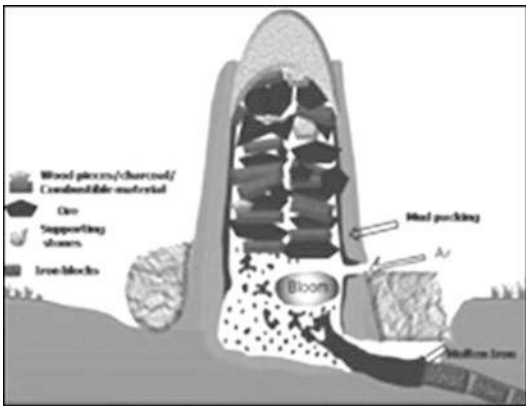
Crucible Steel

The production of crucible steel is generally attributed to centers in India and Sri Lanka where it was produced using the so-called Wootz process. It is also assumed that the appearance of crucible steel in other locations was due to long-distance trade. Only recently it has become apparent that places in Central Asia, like Merv in Turkmenistan and Akhsiket in Uzbekistan, were important centers of crucible steel production (Bronson 1986; Craddock 2003). The Central Asian finds are all from excavations and date from the eighth to twelfth centuries CE, while the Indian/Sri Lankan material is as early as 300 BCE (Ranganathan and Srinivasan 2004).

Archaeological evidence for both the bloomery and crucible steel methods was retrieved from the Kanchipuram district in southern India (Pisipaty 2016). Early Iron Age settlements and iron smelting and workshop areas were traced in India and iron technologies, from bloomery to advanced crucible methods, with the production of corrosion-resistant iron, appeared in India. Further, evidence on habitations and iron smelting workshops, as well as huge megalithic burial structures (Pisipaty 2013), has been reported for the first time at Kanchipuram region in southern part of India; such evidence is very rare in India and elsewhere.

Evidence of Early Iron Smelting

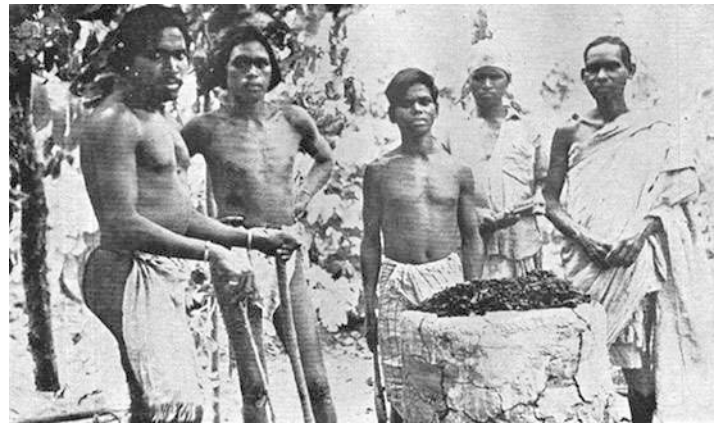
As noted above, Early Iron Age settlements and iron smelting and workshop areas have been traced in the Kanchipuram region in southern India.



Bloomery furnaces in India were usually made of clay and stone pieces, and may also have included boulders in their construction.

It seems from the available evidence that different methods were adopted in the preparation of smelting furnaces in this region (Fig. 1). On flat bedrock, wood and ore pieces, along with carburant materials, were arranged in a circular pattern and tightly packed with clay and supporting stones or boulders. In some furnaces, large boulders were arranged in a semicircular pattern for supporting the furnace and the ore and wood pieces were then piled on top of the boulders. In these furnaces iron ore was smelted in small quantities to produce blooms. The blooms were then reheated and hammered into a more malleable form known as wrought iron.

Slag and iron blocks were found to be scattered in many areas in Vadamangalam (Fig. 2). The evidence shows that the earliest smelting method, known as bloomery smelting or the "direct method" was adopted by the early smiths in this region. The bloomery method of



Early Iron Age India, Fig. 1 Ethnological data

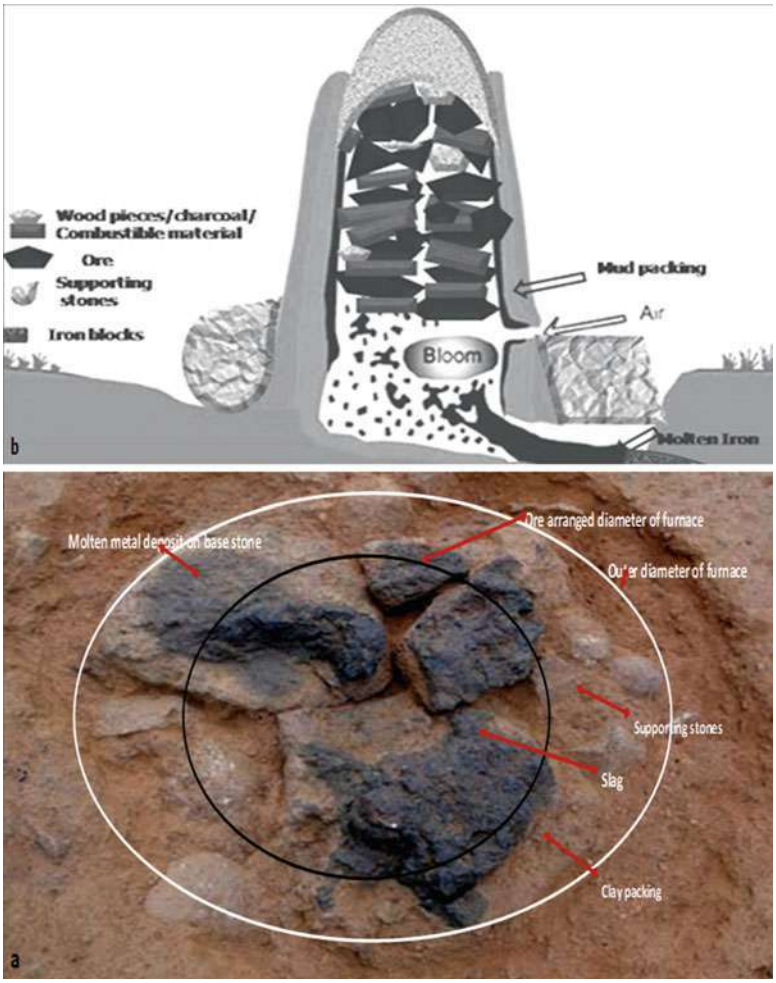
Early Iron Age India, Fig. 2 Iron smelting area; excavations conducted in 2014

smelting was used from around the eighth century BCE and is reported for the first time in India. Bloomery smelting took place in a round furnace that was usually built from clay (Fig. 3). The walls of the furnace have not survived intact, so the original height of the furnace is difficult to determine. Flat stone and terracotta pipes were noticed; these may have been for bellows to blow air into the furnace through the blowing holes in the side. Iron slag and blocks in cubical (15 cm) and cylindrical (15-cm diameter and 25-cm long) shapes, along with cylindrical pipes, were unearthed from the site. Terracotta pipes (for blowing air and cooling the molten iron), together with metal deposits of different sizes were also found.

A series of iron smelting furnaces were found in this area. A more than 3-km-long stretch in the area was dotted with smelting furnaces. Similar smelting method patterns appeared in the entire area.

On flat bedrock (Fig. 3), wood and ore pieces, along with carburant materials, were arranged in a circular pattern and tightly packed with clay on the outer surface, with supporting stones or boulders. In some furnaces, large boulders were arranged in a semicircular pattern to support the furnace and then the ore and wood pieces were piled on top of the boulders.

Evidence unearthed in the excavations has provided information about early iron smelting methods in India. The iron was made in a simple furnace (Fig. 3) known as a shaft furnace.



Early Iron Age India, Fig. 3 (**a**) Ground plan of excavation. (**b**) Tapping of a bloomery furnace

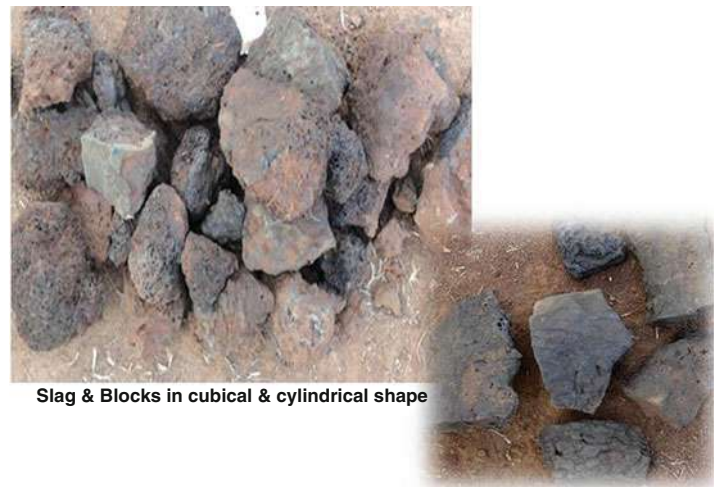
A cylinder of clay was built about a meter high with an arch at the bottom to allow slag to run off. Charcoal and iron ore were put into the furnace in layers. Some form of bellows would have been needed to raise the temperature to 1300° C in order to form a bloom (a mixture of molten iron and waste materials). This crude iron mixture would then be taken out of the furnace and heated and hammered until all the waste had been driven off, producing wrought iron. This iron was then used for making tools and weapons and the waste left behind is what we now call bloomery slag or cinders (Figs. 4 and 5).

The excavated evidence from India shows that the typical furnace had a height range from 60 to 100 cm, and a width of 30 to 50 cm at the bottom and 20–30 cm at the top. To reach the desired high temperature, bellows would have been used for forced air intake.

Crucible steel

During the early centuries of the present era, India was a production center for high-quality steel and exported such products to different parts of the world. In these times, in certain

Early Iron Age India, Fig. 4 Tuyères with metal deposit



Early Iron Age India, Fig. 5 Ingot & Slag from Bloomery furnace

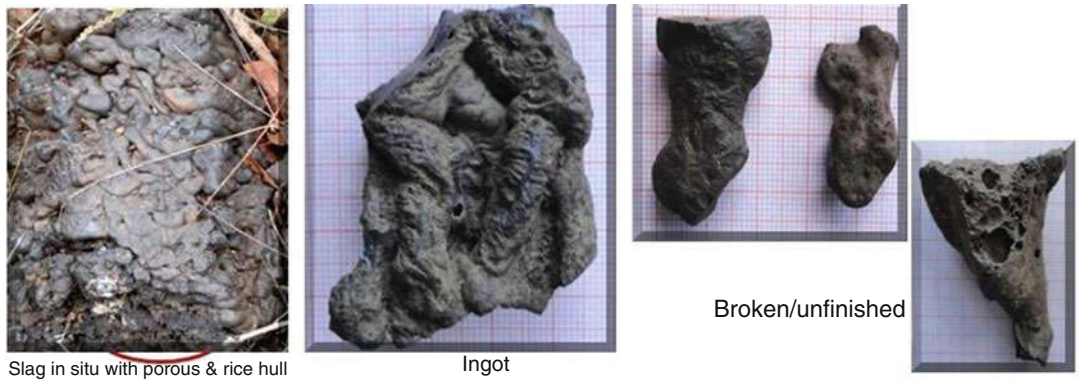
parts of the country, high-quality steel with a water pattern was used for making swords. The swords produced with this steel were famous all over the world as Damascus steel; the steel had excellent qualities of malleability, ductility, and durability of edge. Damascus steel swords are mostly preserved in collections in the Middle East, and experts in metallurgical sciences have tried to understand the processes used by the Indian artisans and master craftsmen (Fig. 6).

Early iron workshops were found in three different areas in Pal Nellur village, Kanchipuram, in southern India. Ore and slag, a terracotta crucible (Fig. 7), and pipes of different sizes were unearthed from the village. Unfinished or discarded objects, crucibles, and mold-like objects were also unearthed from the excavations (Fig. 8). Near the workshop area, an ore dump was retrieved from the site. Ore that was broken into small pieces, like round balls, was reported from the Pal Nellur excavations (Fig. 9a). The pieces may have been

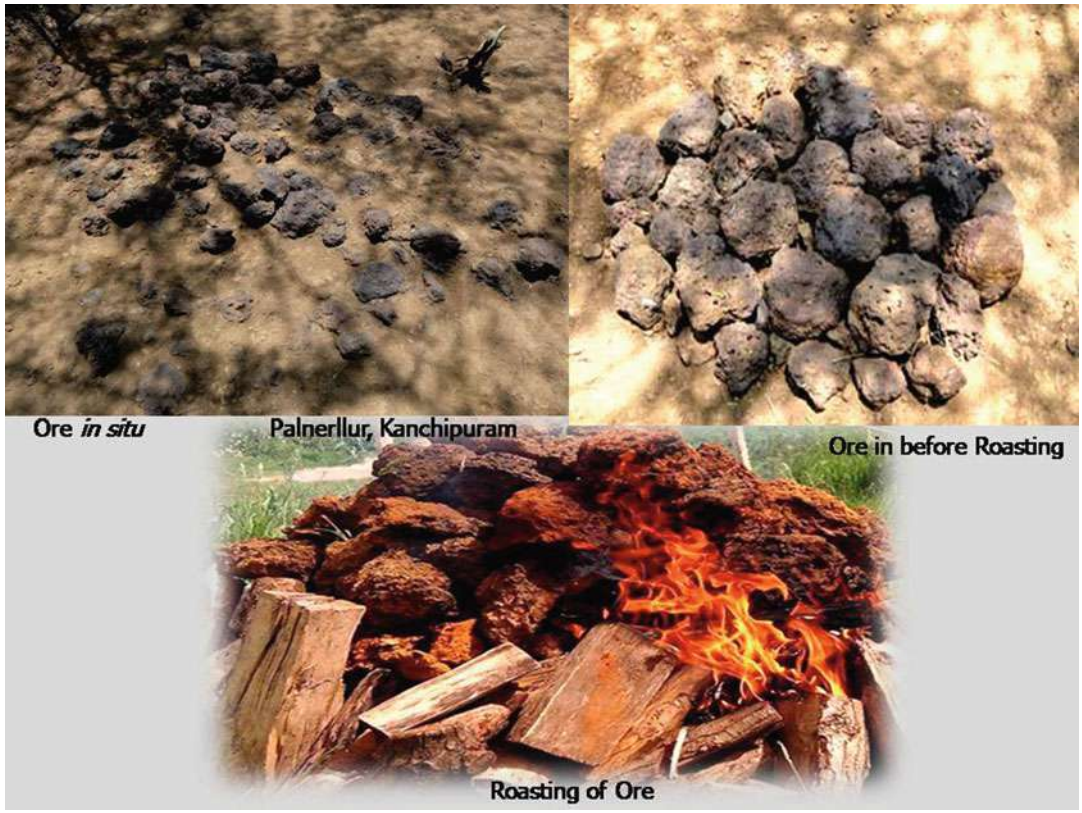
Early Iron Age India, Fig. 6 Early corrosion-resistant iron products from the Indian region (courtesy Google images)

Early Iron Age India, Fig. 7 Crucible in situ

prepared for pre-roasting the ore. After being roasted for a few hours and cooled down, the ore was broken into pieces of approximately 2 cm (more or less) and together with charcoal (layer by layer) heated in a furnace. Any large impurities in the ore could have been crushed and removed.



Early Iron Age India, Fig. 8 Slag, ingot, and unfinished objects



Early Iron Age India, Fig. 9 (a) Iron ore dump near workshop for iron roasting. (b) Roasting of Iron Ore

A widely accepted theoretical model for the reaction inside a furnace during smelting is the following:

$$\text{Hydrated iron oxides } (FeOOH) \; -> \text{hematite } (Fe_2O_3) \; -> \text{magnetite } (Fe_3O_4) -> \text{wüstite } (FeO) -> \text{iron } (Fe)$$

If we assume the ore has been roasted, and the water driven off any hydrated iron oxides, the chemical reaction can be expressed as:

$$3\,Fe_2O_3 + CO \;-> \; 2\,Fe_3O_4 + CO_2$$

$$Fe_3O_4 + CO \;-> 3\,FeO + CO_2$$

$$FeO + CO \;-> Fe + CO_2$$

At the same time, some iron is lost to the production of slag. As well as iron oxides, many ores contain unwanted gangue oxides like silica, and as well as the melting iron on the furnace wall, the fuel itself may also contain numerous other oxides. In the high temperature conditions of the furnace, any silica present is likely to combine with some of the iron (II) oxide, creating an olivine mineral known as fayalite.

$$2FeO + SiO_2 \;--> Fe_2SiO_4$$
$$\text{or} \quad 2FeO.SiO_2$$

Qualitative analysis, by scanning electron microscopy with energy dispersive spectroscopy (SEM-EOS), of a few samples of the slag collected from Pal Nellur showed that the major constituents were iron and silicon. These may represent a fayalite (iron silicate)-type iron slag. The iron charge may have been smelted by the bloomery process to produce high carbon iron by the Wootz crucible process. The crucible fragments found on the mound appear to be from fired crucibles that had been broken to retrieve the finished ingots.

The preliminary investigations indicate that crucible steel production (corrosion-resistant iron) was carried out in the preindustrial era in Tamil Nadu in southern India. Analytical investigations indicate that closed crucible fragments were fired to a high degree of verification with the charge, to produce a high carbon steel. Use was made of refractory reinforced with rice hulls in the manufacture of the crucible, as observed in the process of Wootz steel production. Further archaeometallurgical investigations and surveys are required to determine the extent of metallurgical activity and the antiquity of at Kanchipuram in south India.

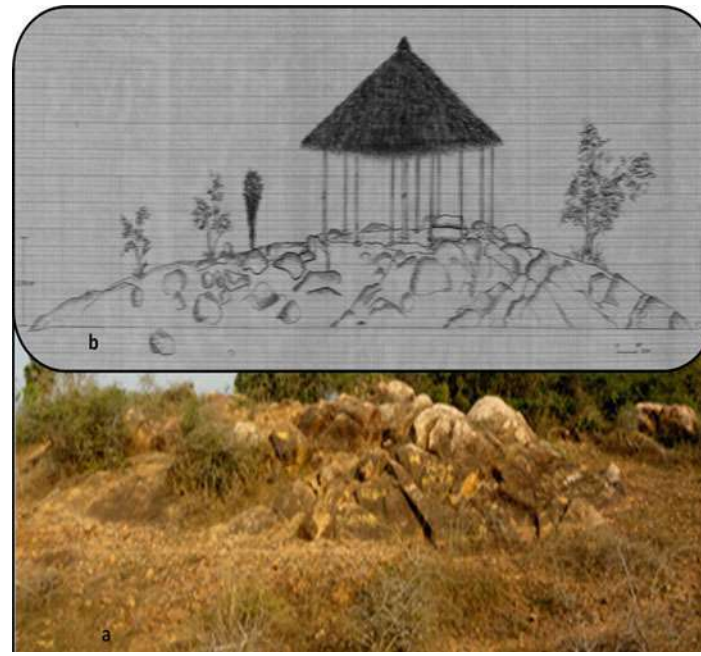
The review of archaeological documents has produced ample evidence regarding the demand for and trading of Indian iron and "Wootz" steel ingots in Western countries. The Persians were among the major buyers of "Wootz" steel ingots to manufacture the famous Damascus swords. The present evidence at Kanchipuram has been reported in an endeavor to develop a better understanding of the ancient Indian crafts of iron and steel making in India. It may be noted that the origin of the production of molten steel was in India. This technology was most probably developed for the first time in the Deccan plateau. The evidence further attests to the industrial activities in India and the production of rust-free iron/Wootz steel, which may have promoted long-distance trade. Traditional Indian metal crafts, in general, flourished until the end of the seventeenth century CE, and their gradual disappearance may have been due to new commercial-based technologies for large-scale industrial production.

Habitational Area

It may be presumed from the unearthed evidence that, during the Early Iron Age, the inhabitants in India at Vadamangalam selected an elevated area (Fig. 10) and a plain surface for their dwellings. The individual dwellings were probably circular in ground plan, aligned with large boulders. A long protected area enclosed with large boulders was also noted. Temporary materials may have been used for roof coverings. Mud floors with post holes were also found in India. This pattern of dwelling structures is not a new finding, but the pattern is very rare in India and is reported for the first time at Vadamangalam.

Memorializing the Dead

People want to remember and honor their loved ones in a special way, even after death. From the very beginning, humans have memorialized their dead in different ways; during the Early Iron Age particularly, such memorialization had increased



Early Iron Age India, Fig. 10 (**a**) Ground plan of a dwelling. (**b**) Tapping of the dwelling

compared with findings in earlier eras. Though the mode of disposal of the body of the deceased (whether cremation or burial) and the associated ritual may vary significantly from society to society, clan to clan, and period to period, human belief and respect for their deceased is similar. By the time of the Early Bronze/Iron Age, burial was the most familiar and best represented form of disposal of the body of the deceased and had become a prominent ritual practice. Practices varied from region to region and group to group, although there were similar traditions for quite some time among different groups. Burial in well demarcated areas protected with large boulders/blocks was a typical mode of disposing of the dead among Early Iron Age societies across the Indian subcontinent.

Memorials, that is, structures at burial sites established in memory of a deceased person by their survivors or other members of the community, are constructed in many different ways. In the Early Iron Age, there were two distinct types of memorial constructions, depending on the geographical zone, one with boulders/large stone blocks, dressed or undressed, and the other with artistic forms of clay elements with or without stones (Roth 2009). Various methods for the burial of the dead, and different types of constructions with more advanced working have been reported from various parts of the southern region of India. Some important and frequently reported types in India, along with rare structures, and those reported for the first time in the archaeological record in India, are enumerated in the following sections.

The Legacy of Megalithic Culture

In the Indian context, the methods of disposal of the body after death and the memorialization of the dead differ from clan to clan and region to region. However, it is interesting to note that the custom of constricting structures for memory of a deceased is still in practice among some groups in India. For example, the Maria Gond people of Bastar in Madhya Pradesh; the Bondo and Gadaba peoples of Orissa; the Oraon and Munda peoples of the Chotanagpur region, now in the state of Jharkhand; and the Khasi and Naga peoples of Assam still memorialize their dead with house structures. Their monuments, which are of a memorial nature, include dolmens, stone circles, and menhirs. The Northeast Indian megalithic culture seems to have a Southeast Asian affiliation rather than a western influence.

In the south Indian context, the remnants of megalithism among the Toda people of Nilgiris are very significant. The account of M.J. Walhouse (1874) regarding the funeral customs of the Toda people reflects surviving burial practices that were followed by the megalithic people. It helps us in understanding the probable customs that existed among the now extinct megalithic builders of south India. The existing burial practices of the Toda people include many common features of megalithic burials, with grave goods including food items, and the use of stone circles to mark the place of the burial.

Structural Activities for After Death Rituals

For a long time the culture of the Early Iron Age was known only through so-called megalithic monuments. Gordon Childe (1948: 5) described megaliths used in after death rituals as usually being constructed of large slabs or blocks of stone, either in their roughly quarried natural form or trimmed. Some of these monuments were rumored to contain gold or some mysterious ash which could convert any metal into gold. As a result, the monuments repeatedly fell victim to vandalism or served as sources of building materials (Nagaraja Rao 1981: 26).

The efforts of the first antiquarian amateurs to investigate the nature of the megaliths were not any better, as they tried to excavate them by means of dynamite (Sankalia 1962: 100). The megalithic burial style is also considered to show Neolithic/Chalcolithic traits (Chakrabarti 2008: 238–239). It may be concluded from recent studies that the megaliths form an integral part of Iron Age culture in south India; however, the study of the period is no longer focused exclusively on these monuments. A radical view states that the so-called megalithic complex does not form an independent cultural entity. However, the time of emergence of this burial tradition and its connection with the beginning of the Iron Age is not entirely clear.

Megaliths have been found in Baluchistan and in Makran in Iran, and in Waghapur, Shah Billawal, and Murad Memon, Asota, the Leh valley of Ladakh; Burzahom and Gufkral in the vicinity of Srinagar; Deosa, Khera, Devidhura, Kota, Banda, Mirzapur, and Varanasi (Kakoria) in Uttar Pradesh; and Saraikela in the Singhbhum district of Bihar. The occurrence of megaliths also extends into northeast India from Manipur to Bastar in Madhya Pradesh and the Hazaribagh and Singhbhum District of Bihar (Thapar 1985: 106). The latter group (i.e. ?) is not affiliated with the Iron Age and constitutes a separate cultural phenomenon. Generally, it can be said that the southern megaliths have a sepulchral character, while the northern ones are rather commemorative and represent the living tradition (Sankalia 1962: 100).

History of Monumental Studies

The study of megalithic monuments in India was started nearly three centuries ago by Babington, on the Malabar Coast in Kerala (Babington 1823: 324–330). Since then, the study of monuments constructed for after death rituals has increased throughout India. Various structures have been reported throughout India. Taylor (1841, 1851: 179–193) explored and excavated a few stone circles and compared these with the structures of the Scythians. Consequent searches for, and research studies of these monuments constructed for after death rituals were carried out in India by many amateur archaeologists, e.g., Fergusson (1871), Wallhouse (1874: 17–34), Rea (1903: 11–14), Hunt (1924: 156), Slater (1924: 66), and Ghurye (1926: 26–57). Their efforts provided an overview of the construction of these structures in India. It may be noted that the structures were reported across the country – from Jammu Kashmir through to Peninsular India.

It may be true that the main objective of the above-mentioned early research attempts was to determine who were the builders of these stone structures constructed for after death rituals. It may be noted that, India being a vast area, although the traditions and customs have some common features they also vary from region to region. Further, differences in the availability of raw materials in different regions are also

important in the construction of structures with megaliths. Hence, regional reports are discussed separately, in the following section.

In 1944, Wheeler conducted the first systematic excavations in India, at Bramhagiri in the western part of the country (Wheeler 1947: 181–308). The excavations provided, for the first time, a relative chronological framework for the Indian megaliths.

The emergence of the Iron Age in India remains a subject of debate in terms of the dates and traits of the appearance of iron across the country, which showed different regional characteristic features and dates of occurrence. It was observed that megalithic burials were not represented as an important feature of the Early Iron Age throughout the subcontinent. For example, the Early Iron Age culture of northern India does not show megalithic burial traditions, whereas these traditions are shown in Vidarbha and Peninsular India. Leshnik (1974), Brubaker (2001: 253–283), Mohanty and Selvakumar (2002: 315–351), and others reported Early Iron Age sociocultural activities in peninsular India.

It is very difficult to depict a typology of the megaliths of India in general because the structures constructed for after death rituals show a variety of methods and techniques to memorialize the deceased. Moreover, there are megaliths that are internally different but exhibit the same external features. Nevertheless, on the basis of the explorations and excavations carried out at different sites in India, the megaliths can be classified into different categories depending upon their outstanding features. These include rock cut burial sites, hood stones and hat stones/cap stones, menhirs, dolmenoid cists, cairn circles, stone circles, pit burials, and barrows. Structural activities and types of memorials in the various regions are enumerated in the following sections.

North India

Sporadic findings and some rare concentrations of megalithic structures in northern India are noteworthy. These monuments are mostly reported from Vindhyas, Mirzapur, and Allahabad (Misra 1972, 1988; Misra and Misra 1977; Gupta 1972; Sharma 1985: 477–480; Singh 1985: 473–476); Jagan Mahal (Gupta 1972; Pant 1985: 481–484); and the Kaimur Range (Pant 1985: 481–484) and Adwa Valley (Misra 1997: 59–65) regions. Iron Age megaliths are also found in the foothills of the Himalayas from Kashmir to the central Himalayas in the Kumaon region and Leh (Sharma 1991: 107; Francke 1909–10: 104 as cited in Gupta 1972; Agrawal and Kharakwal 1998; Nautiyal 2002: 74–80). Early Iron Age settlements have also been reported along with monuments at Gufkral and Kumaon excavations (Sharma 1991: 107; Kennedy 2000).

Western India

Early Iron Age burials are also reported in Gujarat, although here they coexisted with the Early Historic period, as revealed from burial appendage (Gupta 1972). Structures with megaliths were also reported in Rewa, Satna, Hoshangabad, and the Sidhi district of Madhya Pradesh (Indian Archaeology –a Review (IAR) 1963–64: 39; 1975–76: 27; 1979–80: 41, 46 & 49; 1979–80: 41; 1980–81: 70; 1982–83:5), as well as at Vindhyanchal and in the Ganga-Karmanasa river valley. Excavations carried out in the megaliths at Kakoria and Kotia revealed single culture remains of the Early Iron Age in the megaliths (Sharma 1985: 477–480; Singh 1985: 473–476; Mishra 1989: 191–193). These megaliths belong to the pre-Iron Age and Early Iron Age and were dated, respectively, as being from 1500 to 1000 BCE and from 800 to 300 BCE (Singh 1985: 475, 480).

Ganga River Valley

The Early Iron Age in the Ganga River valley region is also associated with PGW culture (Tripathi 2001). The PGW culture is denoted by settlements having a hierarchy of large and small sites, both circular and rectangular structures, beads made of semi-precious stones, and glass objects, as well as the remains of rice (Lal 1984, 1988; Erdosy 1985: 66–79; Tripathi 2001). In the PGW phase at Atranjikhera, many iron implements and tools were recovered, showing advanced iron technology (Gaur 1983). The excavations at Bhagwanpura (Joshi 1976: 178–80) yielded an overlap between the Late Harrapan

and PGW cultures, suggesting that the beginning of the Early Iron Age in this region was around 1300 BCE.

Interestingly, the black and red ware (BRW) culture of northern India, characterized as rural in nature, is also associated with the early use of iron in the middle Ganga plains (Lal 1993; Lal and Dixit 1997: 303–307). Recent investigations at sites such as Lahuradeva, Raja Nal Ka Tila, Dadupur, and Malhar have brought to light the early usage of iron going back to around the first half of the second millennium BCE (Tewari 2003: 536–544). These types of evidence highlight not only the existence of a well-developed iron technology in the BRW phase, but also suggest the use of iron for agricultural and domestic purposes as well. It is noteworthy to mention here that similar BRW was also found from the megaliths excavated in the Adwa valley (Mishra and Mishra 2002: 133–143).

Southern India

The megalithic tradition in the southern region of India has a distinct regional cultural trait with an intrusion of long distance contraction both in terms of burial type and the associated ceramic industry. In the south Indian megalithic tradition, BRW, along with russet-coated painted ware (RCPW) constitute the main ceramic types.

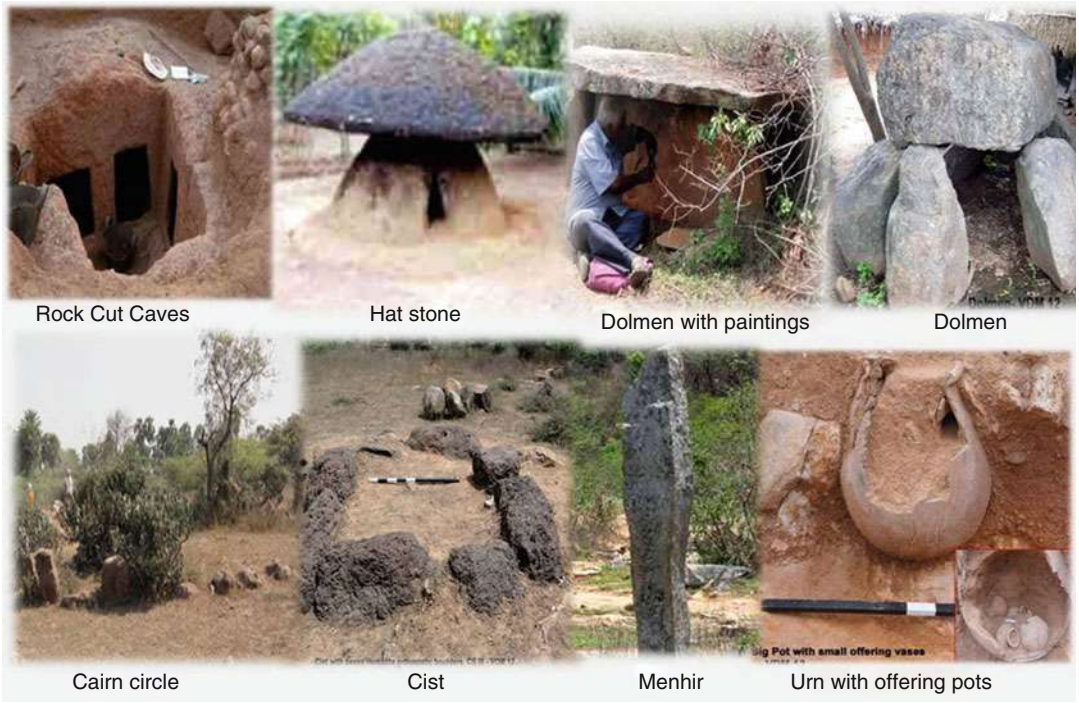
It is important to note here that Deccan megalithic traditions also have BRW as component ware; nevertheless, their predominant and characteristic ceramic is micaceous red ware. Same is the case with burial type. The principal megalithic burial types of southern India are cists and dolmens, whereas stone circles and cairn circles are the main megalithic type in Vidarbha. The megalithic tradition of Kerala is also notable for its varied architecture, despite its similarities in pottery with Tamil Nadu and Karnataka.

Studies pertaining to the Early Iron Age period in India deal with a plethora of different issues and have been carried out by scholars over the past five to six centuries. Noteworthy scholarly research related to interesting evidence in various fields is found in the works of the following scholars: the distribution pattern and typology of structures, by Krishnaswamy (1949), Sundara (1979), Leshnik (1972), Misra (1977), Sharma (1991), and Singh (1985); technology, by Moorti (1994), Rao (1972), Gogte (1982), Mujumdar (1969), Soundararajan (1969), Gururaja Rao (1972), Agarwal et al. (1990), and Biswas and Biswas (1996), and mortuary aspects, by Mohanty and Walimbe (1996) and Kennedy (2000).

Settlement patterns have been discussed by Leshnik (1974: 247), Narasimaiah (1980: 201), Moorti (1994), Gururaj Rao (1972), Deo (1970, 1985), Rajan (2013), Mohanty and Selvakumar (2002: 313–351), Pisipaty (2017, and others. The chronology of structures may be found in the works of Pearse (1869), Wheeler (1947), Nagaraja Rao (1963, 1971), Mohanty and Selvakumar (2002), Mohanty (2005), Vaidya and Mohanty (2010, 2012), Das et al. (2012, 2013), Rajan (2013), Sontakke (2013, 2013a), and Sontakke and Joge (2009), whereas ethnoarchaeological discussions are found in the works of Elwin (1945), Singh (1985), and Binodini Devi (1993).

Typology of Structures

The typology of megalith and other structures constructed for after death rituals in India is very difficult to depict, as these structures vary and may be quite elaborate. A variety of methods and techniques were employed to memorialize the deceased. Because India is a vast country with different geomorphological zones, the availability of raw material also played an important role in the constructions of the structures. Moreover, in most regions, structures constructed with megaliths are internally different but exhibit the same external features. Nevertheless, on the basis of the explorations and excavations carried out at different sites in India, the memorial structures, which maybe primary or secondary, can be classified into different categories based on their outstanding features. These categories include: rock cut caves, hood stones and hat stones/cap stones, menhirs, dolmenoid cists, cairn circles, stone circles, pit burials, and barrows (Fig. 11), and their details are discussed in the sections below.



Early Iron Age India, Fig. 11 Common types of structures memorializing the dead

Northeastern India is one of the major areas of megalithic burial sites. It may also be noted that India is very important for the study of living tradition. The after death rituals practiced by the society here, and their customs, indicate the prevalence of early traditions and beliefs (Singh 1985: 491–496; Devi 1993). Cairn circles with or without chambers and stone circles are the main megalithic types observed in the northeast.

Rock Cut Caves

Rock cut caves are not common in the northeast region, with this type being reported more in the southernmost part of India. These caves are scooped out of soft laterite, as found in the southern part of the West Coast. These rock cut cave tombs are peculiar to this region and occur in the Cochin and Malabar regions of Kerala and are found at many sites e.g., Chowwannur, Kakkar, Porkalam, Eyal, and Kattakampal. The architecture of these rock cut burial caves in the Cochin region is of four types—(i) caves with a central pillar, (ii) caves without a central pillar, (iii) caves with a deep opening, and (iv) multichambered caves.

Hood Stones (Kudaikallu) and Hat Stones/Cap Stones (Toppikkals)

These memorial structures consist of a dome-shaped dressed laterite block, or hood-like stones (Kudaikallu). The structure covers an underground circular pit cut into a natural rock and may have a stairway. In some cases, a plano-convex slab rests on three or four quadrilateral clinostatic boulders, forming a square base and a truncated top, on which rests the toppikkal or the hat stone. This also covers an underground burial pit containing a funerary urn and other grave furnishings. Usually, the burial pit contains a burial urn covered with a convex or dome-shaped pottery lid or a stone slab, and contains skeletal remains, small pots, and sometimes ashes. Similar monuments are commonly encountered in the Cochin and Malabar regions extending along the Western Ghats into the Coimbatore region up to the Noyyal River valley in Tamil Nadu.

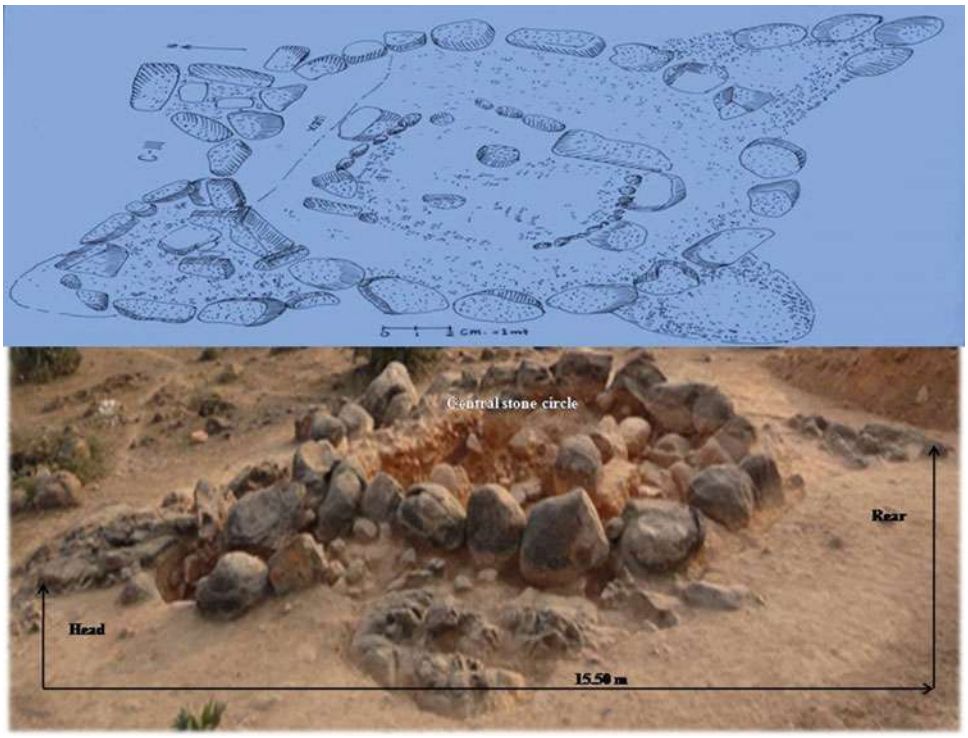
Menhirs

Menhirs are monolithic pillars or flat stones planted vertically into the ground, ranging from 1–5 m in height. They are often rudely dressed or not dressed, but occasionally they are dressed. These are essentially commemorative stone pillars set up at or near a burial spot; they have been reported at Komalaparathala in Kerala and at a number of other sites in India.

Zoomorphic Forms

Structures in different zoomorphic forms, such as reptiles (Fig. 12) were reported for the first time, from Tamil Nadu in southern India, at recent excavations conducted by the present author. This form was not only reported for the first time but is also new to the archaeological record. The total length of the structure is 15.50 m and its breadth is 12 m; it is made of natural bedrock. In the middle of the structure a circular pit has been made and stone has been removed up to 1.50 m depth. On four sides the non-retouched bedrock looks like a head, tail, and limbs. The total figure looks like a tortoise. There is a central circular structure that is 24 m in circumference; it is made of 21 huge semi-dressed boulders, two of which (numbers 6 and 21a) are well dressed. The central structure is two-chambered (8 and 7 × 3 feet) and is placed on a huge monolithic well-dressed sandstone slab from the same site, Vadamangalam in Kanchipuram district with arms extending toward the east. There are no grave offerings or mortal remains, except for two carnelian beads and two terracotta legged sarcophagi in the head portion. This well-planned and highly technically skilled structure was built to memorialize the deceased. It may be presumed from the evidence that the structure was constructed as the memorial of an important person(s) in the society.

Also in Tamil Nadu, other structures with reptile-shaped extensions on four sides, demarcated with boulders placed in circular fashion around seven orthostats cists, as well as cists and dolmens, were reported. All these forms of



Early Iron Age India, Fig. 12 Structure in the form of a tortoise

structures to memorialize the dead are reported for the first time in the records for this region and elsewhere.

Another type of grave structure, sarcophagi, have also been found in India. The fashion for anthropoid sarcophagi had spread from Egypt to the Near East by the second half of the second millennium BCE. The Egyptians cremated their dead and buried the urns containing the ashes in elaborate underground tombs with good protection and demarcation. A heavily reconstructed sarcophagus made of terracotta was unearthed in from different parts of India. Other sarcophagi found at ? in India varied in length from 0.65 to 2.15 m and they had two to four rows of legs. Different forms of sarcophagi, such as ram-shaped (Fig. 13) and elephant-leg- and trunk-shaped, are unique examples of the artistic skill shown in clay modeling (Gururaja Rao 1972) in grave structures.

Other structures for memorializing the dead were constructed with terracotta rings; these not only constitute unique evidence but also were reported for the first time in the records of archaeology. The ring structures were unearthed in southern India from the Vegavathi river near Kanchipuram, Tamil Nadu. More than 35 of these structures were exposed in the dry river channel and many more were found in a disturbed condition (Pisipaty 2009, 2011, 2012). They were all constructed with seven terracotta rings of similar measurements (75 cm diameter and 15 cm height, with 5-cm thickness) and contained grave offerings (Fig. 14). Well-fired earthenware vessels, five in all, were also found; these were made of pots portion, and they may have been utilized for cooking and offerings. Three of the vessels have a round-shaped body and are of similar capacity, while one vessel has a spout.

Urn burial (Fig. 15) were used as primary or secondary burials. After a person died, the survivors cremated the body and collected the ashes in an urn as a secondary burial; some inhumation cases are also reported in this category of practice. In Tamil Nadu, in southern India (Gururaja Rao 1972; Leshnik 1974), broken pots with Tamil Brahmi inscriptions were placed in urns that could have contained the bodies of the dead or their bones. At Marungur, which is an urn burial site, and at sites of cist burials at Kodumanal and Porunthal in the Dindigul district, potsherds with Tamil Brahmi inscriptions have been found. From the Vegavati river, near Kanchipuram, a unique example of the funerary rituals of in India was unearthed. This was a globular vase with a drawing of two persons incised on its painted portion; however, the body portion of the vase was damaged (Pisipaty 2012) (Fig. 16).

Early Iron Age India, Fig. 13 Terracotta sarcophagi in Tamil Nadu, South India. (**a**) Ram-shaped sarcophagus (after Gururaj Rao 1972); (**b**, **c**) sarcophagus with legs and lid

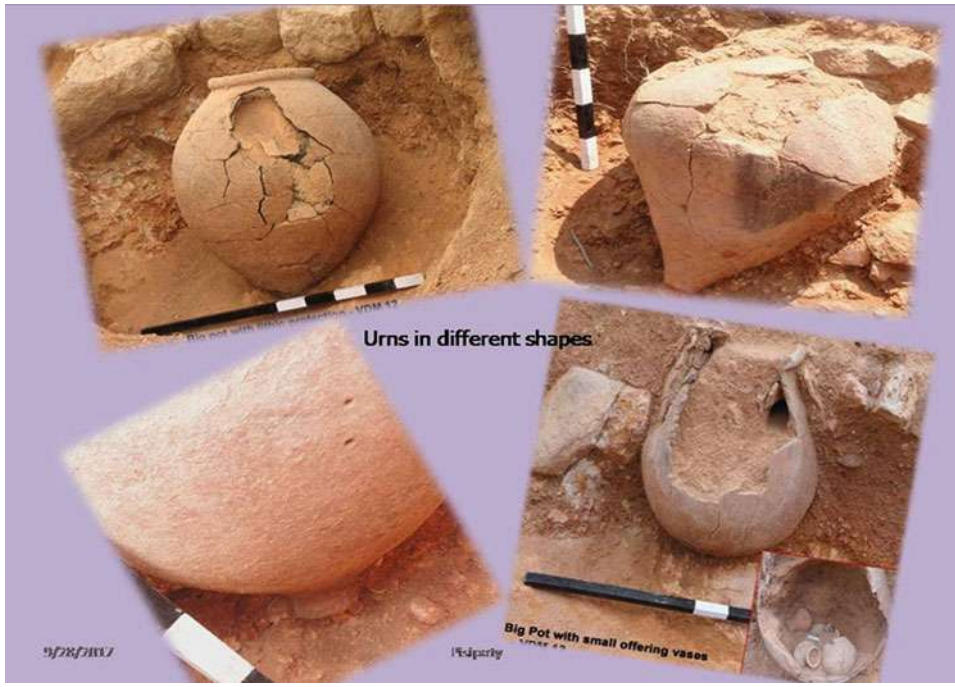
Early Iron Age India, Fig. 14 Offerings in an urn

It may be noted that although the memorialization of the dead was a common practice throughout the India, the ways this was done varied. As noted earlier, the mode of disposal and ritual may vary from society to society, clan to clan, and period to period, but human respect for the dead is almost the same in all geographical zones. By the time of the Early Iron Age, burial of the dead was the most familiar and best represented form of body disposal and had become a prominent ritual practice.

Grave Furniture

The grave represents the final stage in the funerary ritual celebrated by the survivors. Early Iron Age graves often contain information about different kinds of rituals that were part of the funerary celebrations. Rich graves contain special vessels associated with the serving and consuming of liquids and intoxicants. In some cases, these vessels are luxury imports and imitations of vessels used elsewhere (found particularly in areas on trade routes) or in other cases they are lavish local products. As a number of investigators (Arnold 1999; Dietler 1990; Alelshin 1983) have shown, the drinking and feasting vessels often form structured sets in the graves.

The structures constructed for after death rituals have yielded a variety of objects that have proven to be very important for us in the study of Early Iron Age culture. The people of the Early Iron Age took pains to construct elaborate tombs that required much labor and they furnished them with as many essential objects as they could afford. They thought this practice to be necessary as they believed in life after death. And so the dead were suitably provided with a place to live in and with goods for their essential needs, as well as personal belongings.



Early Iron Age India, Fig. 15 Urn burial

Early Iron Age India, Fig. 16 Terracotta ring memorials, Kanchipuram, Tamil Nadu, South India (from the author's personal file)

In India, especially in the southern region, Early Iron Age grave furniture consisted of a large variety of earthenware and metal objects, ornaments, stone objects, and miscellaneous other materials that either belonged to the deceased or were offered by the relatives. Further, in these memorial structures there was also a large variety of pottery, weapons, and implements, mostly made of iron but often made of stone or copper; and ornaments like terracotta beads, semi-precious stones, gold or copper beads, and shells, strung into necklaces, or rarely made as ear or nose ornaments, armlets, bracelets, and diadems. As well, food was often placed in the structures, as indicated by the presence of paddy husks and chaff and some other cereal plant residues, and sometimes animals had been put in the structures, as indicated by the presence of sometimes complete skeletal remains. Pots made of different ceramic materials, used both for cooking and for offerings, have been retrieved from the structures of after death rituals throughout the India. However, PGW, northern black polished ware (NBPW), BRW, and black ware (BW) are the most common pottery types reported in grave goods in northern India, whereas BRW, BW, and RCPW are reported in the south, as well as the usual red ware. Imported and imitation wares were also reported from places on trade routes. Jugs of different sizes, with or without a spout, were placed with liquid offerings.

The Early Iron Age in India is associated with three important diagnostic pottery types: PGW (c. 800 – 350 BCE); NBPW (c. 600 – 100 BCE); and BRW (c. 900 BCE – 100 CE) (Gaur 1983; Lal 1954: 13, 16, 1992: 425; Singh 1979: 315; Wheeler 1962: 34–35). However, there is a difference of opinion on the dating of BRW among scholars: Chakrabarti believes that it predates PGW (1992: 61), whereas Habib (1997: 20) argues that it postdates PGW in peninsular India. At upper Gangetic Valley sites such as Hastinapur, Atranjikhera, and Noh, iron artifacts are associated with PGW and NBPW (Chakrabarti 1992; Gaur 1983; Lal 1954; Singh 1979: 315), whereas at Chirand and Mahisdal in eastern India (Allchin and Allchin 1993b: 210–212) and at such central Indian sites as Nagda, Eran, and Navdatoli (Chakrabarti 1977) BRW and NBPW are associated with iron artifacts. At south Indian sites, BRW was found, with or without RCPW (Moorti 1994).

The pottery types most often associated with the megalithic culture in India are BRW, burnished black ware, red ware, micaceous red ware, gray ware, and RCPW. The wheel-turned pottery essentially consists of utilitarian shapes and a majority of the forms probably served as tableware in early society. The prominent shapes encountered in grave furniture are a variety of bowls, dishes, lids or covers, vases, basins, legged jars, channel-spouted vessels, and conjoins. Some specific shapes are found in limited types of pottery; for instance, circular ring stands, knobbed and rimmed lids with bird or animal finials, and tulip-shaped lids are found in black ware, and legged vessels and urns are found in red ware. Graffiti or incisions are generally seen on the surfaces of these items, although such markings are occasionally seen on the inner portion of the offerings. Urns and sarcophagi of different sizes and shapes, with or without decoration, have been reported.

All these varieties of pottery are characterized by the use of fine materials and are produced from well levigated clay, rarely with sand or such gritty material. The vessels were generally well fired in open kilns at low temperatures. Wheeler (1948) opines that possibly the pottery was turned on a slow wheel.

The evidence of pottery kilns from at least two sites, Polakonda and Beltada Banahalli, can be taken as supportive evidence for the practice of this craft. Although the evidence at both these sites comes from late Neolithic levels, there appears to be a continuation in the habitational deposit bearing megalithic levels. The wide variety of shapes, in different materials, that would have served as tableware for eating and drinking and as cooking utensils, as well as the technical efficiency evident in the preparation of these ceramics or pottery, hints at a professional class of potters and suggests that pottery making was an important economic activity.

The ancient people began to draw symbols of their emotions in the form of graffiti marks on easily available materials such as baked mud objects and stone surfaces. These marks on earthenware are often found on Indian pottery in general and particularly on most of the Early Iron Age memorial structures. These symbols on the earthenware were incised with a sharp needle both before and after firing or were engraved on clay pots that were either in a leather-hard condition or after baking. These incisions show single and ligature forms and range from small lines to complex designs. The symbols include swastikas; tridents; ladders; geometrical forms such as triangles, squares, rectangles, pyramids, circles, and single or multiple straight or curved lines; human or animal forms; and nature-related forms like the sun, clouds, rivers, hills, trees, and vines in many combinations. In general, most of the marks are on the outer surface and at the shoulder, neck, rim, or belly portion of the pots (Fig. 17). However, a few pots with graffiti marks on the base and inside the vessel were reported.

Early Iron Age India, Fig. 17 Graffiti marks on pottery from grave furniture

Evidence of Trade and Exchange Networks

Excavations in India have yielded various non-local items among the grave goods; the presence of these items indicates that there were exchange activities during the Early Iron Age. Imported and imitation ware, carnelian beads and other items reported from various sites on coastal and trade routes direct us to the presence of trade activities. Archaeological remains such as rouletted ware, amphoras, and other ceramic materials found at many sites have shown that the inter-regional and intra-regional exchange of goods was fairly well established in India by the end of the last millennium BCE. Regional variations in the production of commodities and the non-availability of local raw materials/finished goods had led to long-distance transactions under the initiative of long-distance traders from India, as well as other countries overseas. The exchange network, which was in an incipient state during the Early Iron Age, expanded over the centuries as a result of internal dynamics and external impetus involving the demand for goods in other parts of the subcontinent as well as the Mediterranean region.

Time Frame

The date and origin of the introduction of iron artifacts and iron work into India are a much debated research problem. According to the Rig Veda, an early text of in India, the second millennium BCE is often suggested as the timing. Early researchers reported that iron-working originated in India around 700–600 BCE (Gordon 1950; Wheeler 1959). Subsequent research studies and dating technologies push this date back toward the second millennium BCE (Chakrabarti 1992: 10–12) along PGW. Chakrabarti (1974: 354, 1976: 122) also suggested, regarding the origin of technology, that India was a separate and possibly independent center of early iron manufacture.

Considering the radiocarbon dates for the iron-bearing deposits at Atranjikhera, Kaushambi, and Jakhera near Uttar Pradesh, at Nagda and Eran in central India, and Hallur in Karnataka,

dates around 1000 BCE were suggested (Subramanyam 1964; Banarjee 1965; Chakrabarti 1974; Nagarajarao 1974).

Recent technical studies of iron materials dated around 1000 BCE at Komaranahalli (Karnataka) showed that the smiths at this site could deal with large artifacts, implying that they had already been experimenting for centuries (Agrawal et al. 1985: 228–29). Sahi (1979: 366) drew attention to the presence of iron in Chalcolithic deposits at Ahar and suggested that "the date of the beginning of iron smelting in India may well be placed as early as the sixteenth century BCE" and "by about the early decade of thirteenth century BCE iron smelting was definitely known in India on a bigger scale." On the basis of four radiocarbon measurements, ranging between 3790 ± 110 BP and 3570 ± 100 BP, available for the Megalithic period (without iron), Sharma (1992: 64, 67) has proposed a date range of 1550–1300 uncal. BCE for the subsequent iron-bearing period at Gufkral (Jammu & Kashmir).

It may also be true that the Early Iron Age in the Indian subcontinent may have succeeded the Late Harappan culture or Indus Valley tradition. The Early Iron Age in India is associated with three important diagnostic pottery types—PGW, NBPW, and BRW (Chakrabarti 1992; Gaur 1983; Lal 1954: 13, 16, 1992: 425; Singh 1979: 315; Wheeler 1962: 34–35). The main Early Iron Age cultures of northern India are associated with the PGW culture (1200 to 600 BCE) and the NBPW culture (700 to 200 BCE), whereas in the south the Early Iron Age cultures were mostly associated with BRWand RCPW.

Eastern Indian sites such as Chirand and Mahishadal were associated with BRW and NBPW (Allchin and Allchin 1993b: 210–212), whereas central Indian sites such as Nagda, Eran, and Navdatoli were associated with BRW and NBPW (Chakrabarti 1977). Toward the north and northwestern part of the subcontinent, now in Pakistan, the material culture of the Early Iron Age is first mentioned in the context of protohistoric graves or Gandhara graves, corresponding to period VII of the Ghalegay sequence (c 500 BCE) (Stacul 1970, 1979a, 1995, 2001).

Recent excavations in Uttar Pradesh have turned up iron artifacts, furnaces, tuyeres, and slag in layers that have been radiocarbon dated to between c. BCE 1800 and 1000. Tewari (2003: 543) suggested three sets of dates during which iron working was practiced at these sites in northern India: c. 1200–900 cal. BCE, c. 1400–1200 cal. BCE, and c. 1800–1500 cal. BCE. Prior to this report, the earliest date for iron artifacts came from the Megalithic phase at Gufkral site in Kashmir, with a date rage of 1550–1300 uncal. BCE (Sharma 1992: 67). Allchin and Allchin (1993b: 345) and Gaur (1997: 20, 1983: 15) proposed a date of c. 1200–1000 cal. BCE for iron working in the mid-Ganga Valley, and Chakrabarti (1977: 183) also suggested a similar date, of c. 1270 cal. BCE, for iron working there.

Inferences Drawn Regarding the Early Iron Age in India

It may be noted that the history of iron metallurgy has been a long process of evolution. Evidence indicates that it took centuries of concerted effort to improve upon metallurgical processes. It is the spirit of human endeavor that allowed humans to innovate, improvise, and master technology through experimentation. Iron technology not only developed from simple wrought iron to corrosion-resistant steel but also from tiny fragments and small objects to colossal structures. In this context, it is worthwhile to mention Chakrabarti's (1974: 354, 1976: 122) opinion that "there is no logical basis to connect the beginning of iron in India with any diffusion from the west, from Iran and beyond" and "that India was a separate and possibly independent centre of manufacture of early iron." Sahi (1979: 366) suggested that "the date of the beginning of iron smelting in India may well be placed as early as the sixteenth century BCE" and he noted that iron had occurred "by about the early decade of thirteenth century BCE." It may also be noted that iron smelting on a large scale was definitely known in India for quite a long time.

The development of metallurgy in India appeared in three stages in different periods:

The Early Iron Age (by the end of the second millennium BCE – 700 BCE)

The Middle Iron Age (800–100 BCE)

The Late Iron Age (100 BCE/CE 600)

In the Early Iron Age bimetallic objects like gold alloys or bronze were primarily ornamental rather than functional (Tipathi 2001). Moreover, iron did not completely replace bronze even for hunting weapons or war objects. Iron implements at this stage were sometimes replicas of early bone or stone objects from the Neolithic-Chalcolithic period, indicating a gradual transformation of the medium modeled after bone prototypes. Deliberate carburization was noted in certain cases from this period onward.

In the Second stage or Middle Iron Age in India deliberate smelting was common, and the techniques of carburization and quenching were discerned. The ironsmiths selectively applied specific techniques wherever required. Quenching was well known by the smiths of this stage. A rich variety of iron objects is mentioned in India literature in regional languages such as the Pali and Sanskrit texts of the fifth to fourth centuries BCE. Reports of excavations and the literature show that good quality iron and steel is known to have been produced by the smiths. It is evident from several examples noted above that gifts of steel ingots and swords were given and that steel surgical instruments were made (Tripathi 2001).

Carburized iron production in India not only increased inter-regional trading activities but also attracted long-distance trade. The production of different items for trading also increased. For instance, bead-making and ceramic industries were established to meet the needs of local and long-distance traders. Through trade, regional contacts and sociocultural exchanges also occurred. Many large settlements developed near natural resources, with many satellite centers, ports, and port towns being established as trade centers during this period. As a consequence, trade and commerce created affluent populations in the settlements.

During this second stage there were enormous sociocultural changes. Among the many changes that occurred, the custom of memorializing the dead and the construction of structures with megaliths appeared in the entire Indian region in general, particularly in southern India. The tradition appeared throughout in India with little variation. The relative lack of variation may reflect the availability of raw material and the geographical conditions. It may also be noted that very strong faith and dedicated worship appeared more widespread in southern India. The construction of complicated structures with huge undressed or semi-dressed blocks for after death rituals indicates that highly skilled and laborious efforts were made to create these structures. Vases for offerings, as well as personal belongings, were richly and carefully furnished in the structures.

The third stage or Late Iron Age is considered to show an advanced stage of iron metallurgy. By this time, in the Indian context, iron metallurgy, as well as the utility of iron objects, was greatly advanced. There was a rich variety of tools, implements, weapons, household objects, and common utilitarian items in iron. Heavy iron pillars were made for specific purposes; for example, the Mehrauli iron pillar, which weighs 6096 kg and is 7375 mm in height, 416 mm in diameter at the bottom, and 304 mm at the top, was made for. It was made in the fourth to fifth century CE, in an age of the culmination of technological skill (Fig. 6). At this time, surgical instruments and sophisticated weapons like tridents, swords, and caltrops, reportedly of good quality steel, were used. Organizational capabilities intensified in the course of time, as is evidenced in the colossal structures that came into existence in the early centuries of the Common Era. By this time iron working produced a homogenous type of wrought iron that was employed in colossal structures that commemorated events of great significance to the population, and good quality iron or steel was produced for weapons, tools, and implements. The commercial good quality of iron/steel production of in India attracted trade from other continental regions and these products became a major demand product of in India. Further, the exchange network strengthened and expanded over the centuries as a result of internal dynamics and external impetus involving the demand for goods in other parts of the subcontinent, as well as the Mediterranean region. As a result, there was an era of prosperity and overall growth in different fields in India. The age, lasting from (late Iron Age), earned the title of the Golden Age of Indian history.

Along with metallurgy and technology, a significant change in sociocultural systems also

appeared in India. Among many changes, memorializing the dead was not only a major practice but it also prevailed for many centuries and the practices still live on in the traditions of many groups in India. Sumptuous structures with megaliths of different shapes and sizes dating from the Late Iron Age are reported throughout in India.

In quite a few of the tribal zones in India, we have come across ethnological evidence and the survival of traditional methods of iron working until recent decades. This reinforces the assumption that there is a long and widespread tradition of iron making in different parts of India. It is noteworthy to mention in this context that there are many places that are rich in iron ore and fuel in the remote hilly parts of the country in which preindustrial iron working is done. These regions are still inhabited by ethnic groups who carry out iron smelting. It may also be found that smelting and producing high-carbon iron is still practiced by a few groups; however, many people have changed their profession because of the lack of demand for the product. Thus, there is an uninterrupted history of early iron working until very recently. There must have been stages that this iron working must have gone through.

Of note, many sociocultural systems were established for the first time during the Early Iron Age. Among many customs, after-death activities, which may include any type of meaningful ceremony to commemorate the life of the deceased, not only varied from region to region and clan to clan, but also still prevail in practice. The first burial customs then were crude efforts to protect the living from the spirits which early humans believed had caused the death of the person. It is possible that fear of the dead caused people to burn their bodies to destroy evil spirits. The grave represents the final stage in the funerary ritual celebrated by the survivors. Early Iron Age graves often contain information about different kinds of rituals that were part of the funerary celebrations. Rich graves contain special vessels associated with the serving and consuming of liquids and intoxicants. In some cases, these vessels are luxury imports and in other cases they are lavish local products. Memorial structures in India are also varied and sumptuous. Zoomorphic structures and terracotta sarcophagi, some with ring structures in terracotta, not only show different items used by the different groups of people but also indicate the sociocultural systems of in India. Multidimensional technological advances and the affluence of the societies have been revealed from the material culture of the periods under discussion. Complex societies with a rich culture appeared during the Early Iron Age across India; these complex societies may have resulted from the inter-regional and intra-regional contacts made through trade and commerce.

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Early Peopling of the Atacama Desert

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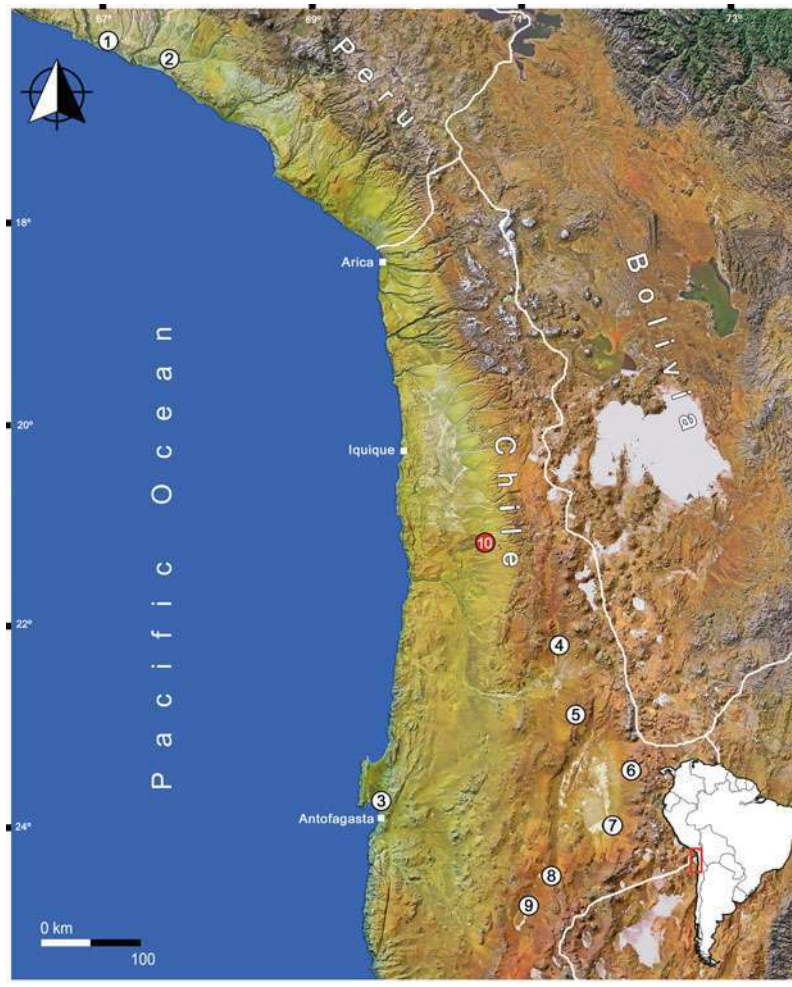
Introduction

The hyperarid conditions of the Atacama Desert preserve remarkable evidence of ancient human foragers beginning at least 13,000 years ago. Although initially considered a harsh and inhospitable environment, recent interdisciplinary research suggests that the Atacama was originally inhabited by highly mobile hunter-gatherers bearing complex technological toolkits in what was a much wetter and ecologically more productive climate (Latorre et al. 2013; Núñez et al. 2002). Ongoing research is exploring the complexity of the socio-environmental dynamics that featured the peopling of the Atacama in the process of the early human colonization of South America, as well as during subsequent cycles of dramatic climate change, social transformations, and population displacements (Santoro et al. 2017).

Definition

The Atacama Desert extends over 10° of latitude from southern Peru to the Copiapó Valley (~17–27°S), encompassing the greater part of northern Chile and stretching from the Pacific coast to the Andes (0–>5000 masl). One of the driest deserts in the world, the annual rainfall in the Atacama ranges from 400 mm/year at high elevations in the northern Chilean Altiplano (18°S) to less than 1 mm/year in its low-elevation hyperarid core. The modern ecosystems of the Atacama Desert are characterized by vast expanses of absolute desert that lacks vegetation and are crosscut by a few deeply incised river canyons, groundwater-fed oasis, and *quebradas* that drain from the Andean highlands to the Pacific coast (Fig. 1). The broad swaths of plantless landscape (often used as an analog for the surface of Mars) are covered by a desert pavement that seals a subsurface sulfate soil composed of anhydrite and gypsum (Fig. 2; Fletcher et al. 2012). As elevation (and rainfall) increases toward the east, a climatic and ecological gradient composed of annuals and cacti appears, which is then progressively replaced by *tolar* shrublands, steppe grasslands, and eventually snow-capped Andean mountains (Armesto et al. 1998; Gutierrez et al. 1998).

Enormous preceramic shell middens located on the Pacific coast led early explorers and archaeologists to comment on the potential great antiquity of human occupation in the Atacama. In fact, the archaic Chinchorro Cultural Complex relied



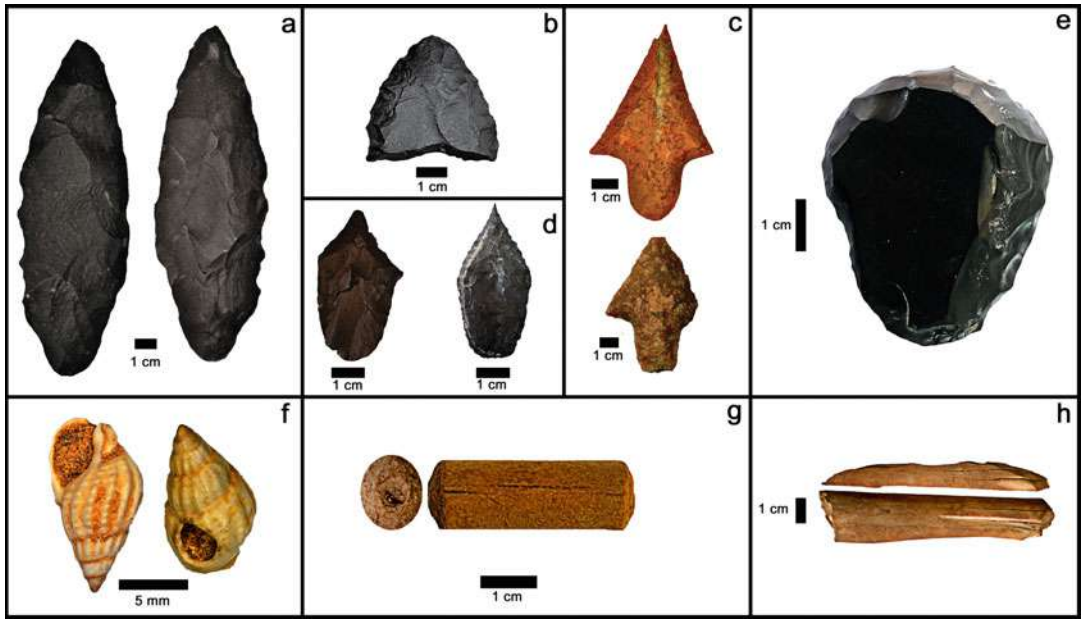
Early Peopling of the Atacama Desert, Fig. 1 Pampa del Tamarugal showing Quebrada Maní 12 (number 10, red circle) between the Pacific coast and the high Andes and contemporaneous late Pleistocene archaeological sites known for the Atacama Desert: (1) Quebrada Jaguay, (2) Quebrada Tacahuay, (3) La Chimba, (4) Alero El Pescador, (5) Tuina, (6) San Lorenzo, (7) Tulán, (8) Imilac, (9) Punta Negra

Early Peopling of the Atacama Desert, Fig. 2 View to the NE of Quebrada Maní 12 archaeological site covered by desert pavement and showing the paleowetland that flourished at the end of the Pleistocene

on the exploitation of the rich coastal resources and featured some of the oldest artificial mummification practices in the world (Arriaza et al. 2008; Marquet et al. 2012). More recent work focused on paleowetland deposits from inland basins and high elevation sites on the Altiplano has revealed new series of open-air sites and rock shelters containing evidence of diverse stone tools associated with early hunter-gatherers. Such sites have been interpreted as transitory camps from coastal groups that traveled seasonally to inland enclaves looking for stone raw materials and plant and animal resources. Until very recently, researchers often assumed that the prevailing hyperarid environment was just as severe in the past as it is today and that the Atacama Desert would only have been a marginal territory for human peopling (Núñez et al. 2016). Nevertheless, the excavation and dating of several new sites, such as Quebrada Maní 12 in the hyperarid Pampa del Tamarugal basin, have revealed the presence of humans during the late Pleistocene, which was then followed by their abrupt disappearance at the onset of the Holocene (Latorre et al. 2013; Grosjean et al. 2005; Núñez et al. 2002; Santoro et al. 2017). These occupations were coeval with other early archaeological sites (older than 11,500 cal B.P.) reported along the coast (i.e., Quebrada Jaguay, Quebrada Tacahuay, La Chimba 13) or in the Atacama Desert highlands (Alero El Pescador, Tuina 1, Tuina 5, San Lorenzo 1, Tulán 109, Imilac, Punta Negra; Fig. 1; Núñez et al. 2016).

The archaeological evidence of several recently discovered archaeological open camps in Pampa del Tamarugal show scattered exposed evidence of human activities that probably included making large open fires, hunting animals, manufacturing and reshaping stone tools for different purposes, preparing animal and plant fibers for weaving, and utilizing large trees (completely absent on the landscape today) for shelter, fuel, and raw material for manufacturing tools (Latorre et al. 2013). Particularly at the Quebrada Maní 12 site, archaeological excavations revealed a prepared hearth for cooking, postholes for tents or places for resting and protection, and a wide range of artifacts from different raw materials and origin including stones, bone, plant and animal fibers, and wood collected nearby. This evidence suggests that the first people to inhabit the Atacama were highly skilled artisans at making finely formalized tools made in stone, wood, and animal as well as plant fibers (Fig. 3).

Access to the coast (either directly or through trade) was evidenced by the presence of shells,

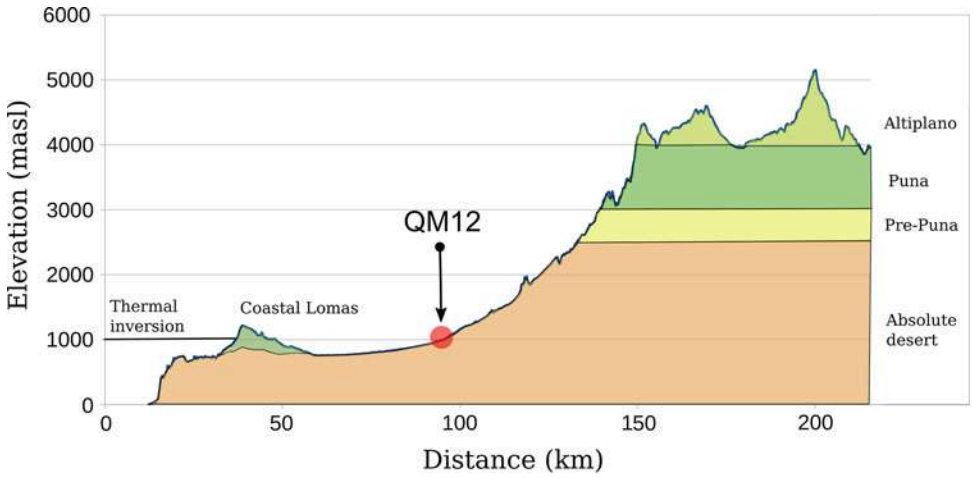


Early Peopling of the Atacama Desert, Fig. 3 (**a**) Bifacial tool; (**b**) broken bifacial tool reworked as a burinant point and as a sidescraper; (**c**) Las Cuevas style triangular stemmed projectile point; (**d**) "Patapatane" style (reworked projectile points); (**e**) frontal scraper; (**f**) gastropod shell (cf. *Nassarius gayii*); (**g**) proximal fragment of a wooden atlatl spear shaft; (**h**) pointed fragments of camelid bone. (Modified from Latorre et al. 2013)

possibly for ornamental and/or ritual purposes. Access to the high Andes is evinced by lithic raw materials (such as obsidian and silicified ignimbrite) for manufacturing tools and iron oxides for use as color pigments or other uses. Thus, the long distance network of these early inhabitants must have covered a circle of at least 160 km from the coast to the high Andes.

A number of recent paleoenvironmental studies suggest that moisture increased along the western Andes Cordillera during two phases of what is now called the Central Andean Pluvial Event (CAPE), the first phase dated to 17,600 and 14,500 years ago whereas the second occurred between 13,800 and 10,500 years ago (Gayo et al. 2012; Nester et al. 2007; Quade et al. 2008). During these phases fluvial and groundwater systems in the Atacama were activated by substantial increases in rainfall at higher elevations in Andes. This reorganization and acceleration of the summer hydrological cycle occurred during the last glacial-interglacial transition and was due to increased advection of moisture from the Amazon and Gran Chaco basins (Latorre et al. 2005; Quade et al. 2008). In turn, this brought about (a) a shallowing of underground aquifers from the high Andes to the Pacific Ocean; (b) outcropping of springs along the Andean foothills, below 3000 m, in currently hyperarid areas; (c) a downslope migration of plant species from higher elevations (>3000 m) into the Prepuna (<2000 m); (d) the flourishing of riparian vegetation and gallery forests in lowland basins (~1000 m) in what are today hyperarid drainages of the Pampa del Tamarugal (~1000 masl); and (e) the concentration of biotic resources (fauna and flora) along these gallery forests, which would have been veritable oases within a predominantly hyperarid landscape (Fig. 4). Thus, although the local environment at low elevations remained hyperarid during the Pleistocene, a network of freshwater oases appeared, which would have served as "stepping-stones" for groups of hunter-gatherers who could have either stayed or traversed the otherwise barren landscape of the Atacama Desert.

Paleoenvironmental data show that the Pampa del Tamarugal basin was considerably more vegetated and wetter during the latest Pleistocene, and the later portion of these wet phases featured the oldest known human occupations (Gayo et al.



Early Peopling of the Atacama Desert, Fig. 4 Elevational profile with modern vegetational belts and the hyperarid absolute desert (red arrow indicates position of Quebrada Maní 12)

2012; Latorre et al. 2013). Coincidently, around ~13,000 years ago, many different biomes across the continent and especially in the southern cone were loci for the peopling of South America, which resulted in the creation of different cultural landscapes integrated into a complex mosaic of ecosystems coupled with continental networks of interaction and transmission of knowledge. Many of these areas were abandoned after 11,000 years ago as extreme aridity increased throughout the Andes. In the Atacama Desert, this pattern is known as "*silencio arqueológico*" or archaeological silence and has been attributed to much reduced environmental productivity that marked the onset of the Holocene. Occasionally brief (typically less than a few hundred years) spells of increased moisture interrupted the overall hyperarid climate, especially during the late Holocene (Núñez et al. 2013, 2016).

Key Issues/Current Debates/Future Directions/Examples

For decades, researchers have assumed that the Atacama stood as an obstacle to human settlement and biotic dispersal. Scientists therefore looked for and studied sites mostly along the Pacific coast or in upper-elevation environments in the adjacent high Andes and ignored the hyperarid core. In recent years, however, new evidence has emerged that gives clues for understanding the cultural complexity and diversity of the peopling of South America across a wide array of landscapes at the end of the last Ice Age. Nevertheless, the lack of well-contextualized and dated sites for the time span from ca. 15,000 to 14,000 years B.P. contrasts with the striking distribution of archaeological sites that date to around 13,000 years B.P. or younger, all of which show great cultural diversity and social contexts, albeit constrained by regional environmental productivity. Thus, questions about how and when human moved into the Americas and how the complexity of both cultural diversity and chronology evolved during the exploration and colonization processes are now one of the most widely scrutinized and debated topics in the archaeology of this continent.

Hyperaridity ensures that the Atacama may eventually be one of few places in South America that is best suited for finding late Pleistocene behavioral remains of hunter-gatherer societies. As this ecosystem completely disappeared at the onset of the Holocene (ca. 11,000 years ago), essentially "freezing" all remains of late Pleistocene antiquity, which were then never overwritten or mixed with evidence of more recent prehistoric activities, it could potentially reduce the gap between systemic and archaeological contexts. As discussed above, ongoing research is beginning to document this "frozen" record and providing a more integrated perspective of the late Pleistocene.

Another interesting theme of current research is regarding the origins of the Chinchorro Cultural Complex, which developed along the Pacific coast during the early Holocene. How the initial occupations in the hyperarid Atacama related to these subsequent cultural developments remains unclear, in part because of a lack of sites that bear evidence of direct continuity between the initial inland foraging versus the later marine subsistence systems. Similarly, the connection between desert adaptations and the coeval development of agropastoralist societies in the Andean highlands to the east of the Atacama are a current research frontier (Santoro et al. 2017).

In summary, considering the archaeological and paleoecological evidence in the Atacama Desert for sites dated between 12,800 and 11,600 years ago, an early and rapid process of human exploration and colonization directly related to the peopling of South America seems to have taken place. Ongoing studies of these prehistoric hunter-gatherer societies in the Atacama Desert are presently increasing our knowledge of this processes based on improved analytical and theoretical approaches.

Cross-References

- ▶ Andes: Prehistoric Period
- ▶ Australian Deserts: Extreme Environments in Archaeology
- ▶ Environmental Reconstruction in Archaeological Science
- ▶ Monte Verde, Archaeology of
- ▶ Núñez, Lautaro
- ▶ Paleoindians
- ▶ Peopling of the Americas
- ▶ South America: Lithic Industries

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Further Reading

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Early Regional Centers: Evolution and Organization

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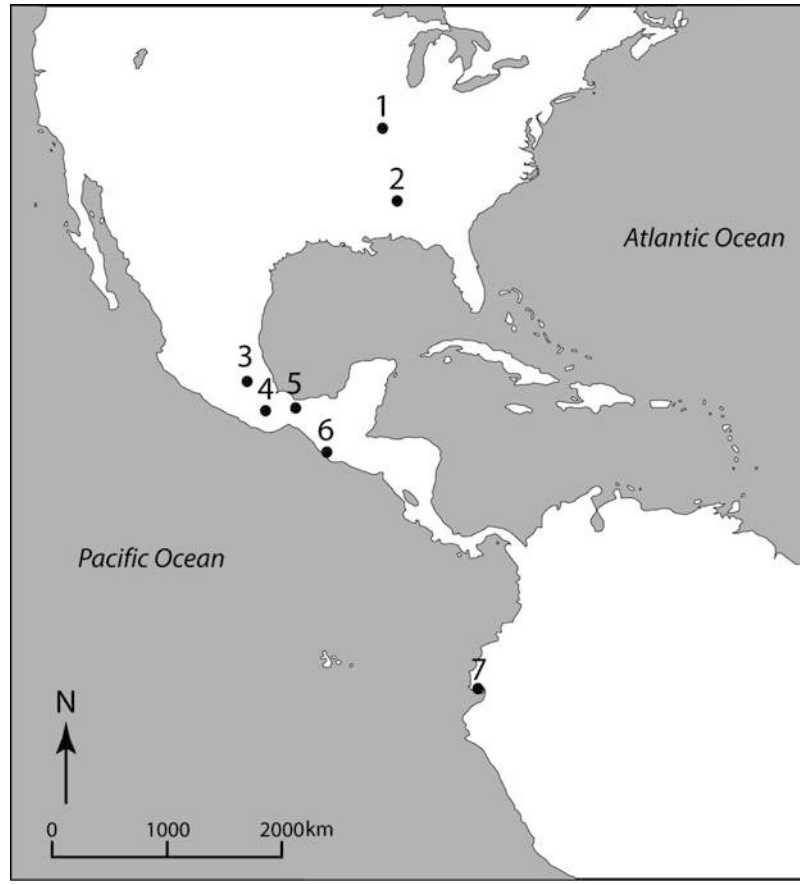
Introduction

The shift from autonomous, egalitarian societies to complex societies with significant social inequalities is a historical phenomenon that occurred across the globe. To understand in part how this occurred, archaeologists have focused on the evolution and organization of early regional centers (Fig. 1). Much has been learned about the development of these ancient settlements, and recent studies utilizing more detailed data are providing rich understandings of the role of early regional centers in human history.

Regional centers are both physical entities and hubs for social interaction. Early regional centers were the loci of new configurations of social processes, human choices, and relationships. Three analytical problems have emerged from the comparative study of these types of sites. These are:



Early Regional Centers: Evolution and Organization,
Fig. 1 Map of several sites in the Americas mentioned in the text, including (1) Cahokia, (2) Moundville, (3) Tlapacoya, (4) San José Mogote, (5) San Lorenzo, (6) Paso de la Amada, and (7) Real Alto

1. The institutionalization of asymmetrical social relationships between people and between communities
2. The emergence of new forms of social integration and frameworks of organization
3. The evolution of these along different historical trajectories dependent on geographic, temporal, and historical context

Definition

Early regional centers were human settlements with a permanent and sedentary residential population. But they were more than just a permanent spot on the map; they were involved with ushering in new kinds of regional relationships. Regional centers are set apart from a network of villages through the daily operation of an asymmetrical regional social network, with the central settlement being most prominent. While interactions between villages within any region could take place on relatively equal grounds, regional centers created imbalanced relationships among communities. The regional asymmetry, however, was not just demographic in nature. It was often operationalized across one or more key dimensions, including (1) economy, (2) politics, or (3) ideology. As such, early regional centers could assume regional prominence when social groups living there utilized their standing as key economic, political, or ideological players to organize other regional populations.

Historical Background

Large-scale regional surveys in the early- to mid-twentieth century established a series of traits that served as criteria for the typological classification

of known archaeological sites. Regional centers were identified when evidence recovered from a site matched a series of expected features, including certain presumed population and settlement sizes, the presence of central and public spaces, the occurrence of specialized buildings, recognition that the settlement served as a nexus for regional trade, or indications that a segment of individuals living there were specialists who made unique and important craft goods. These traits allowed archaeologists to quickly distinguish probable regional centers from smaller-scale villages, larger urban centers, or other settlement types.

The development of processual archaeology in the 1960s and 1970s saw a shift in focus toward understanding the organization and operation of human social systems, with the objective to develop and assess models to describe the evolution of those systems. Regional centers were often defined as the central settlement of a regional polity, consisting of a group of villages that found themselves under the authority of a more dominant settlement. This kind of network, resulting from the loss of village autonomy to a politically dominant group, is commonly referred to as a chiefdom. Whereas chiefly rulers who lived at regional centers were sometimes assumed to direct the organization of not only politics but also economic and ritual-ideological life, already by the early 1970s, many archaeologists were aware that smaller human settlements often contained facilities for local ritual affairs (cf. Flannery 1976).

More recently, archaeologists have begun to decouple the study of settlements and their constitutive social practices from the study of sociopolitical evolution (Yoffee et al. 1999). The analytical focus is increasingly directed toward understanding the dynamic social processes occurring within early regional centers and between people residing in centers and those residing in smaller villages, hamlets, or with people engaging a mobile lifestyle.

New approaches recognize that greater diversity exists in the ways humans organize and that an analytical focus upon any number of historical trajectories can provide important information about social change through time (Birch 2013; Chesson and Goodale 2014). Thus, a focus on the development of regional centers and the kinds of activities that they embodied is a significant research objective in its own right. Importantly, this allows archaeologists to better understand the conditions under which regional centers and social complexity emerged, and it also positions researchers to ask questions about why many of these settlements suffered drop-offs in regional prominence or were abandoned outright.

Key Issues

Archaeologists studying early regional centers have identified several key issues involved with their emergence and organization. Four primary issues considered here are:

1. The human institutions that developed to take advantage of the new opportunities and the challenges of living in regional centers
2. The structural organization of early regional centers that resulted from the intersection of these institutions and how regional groups were centralized (i.e., through economic, political, or ideological dimensions)
3. The dynamics of local and regional institutions and the trajectories of their emergence, persistence, growth, and collapse
4. The tempos of variable trajectories

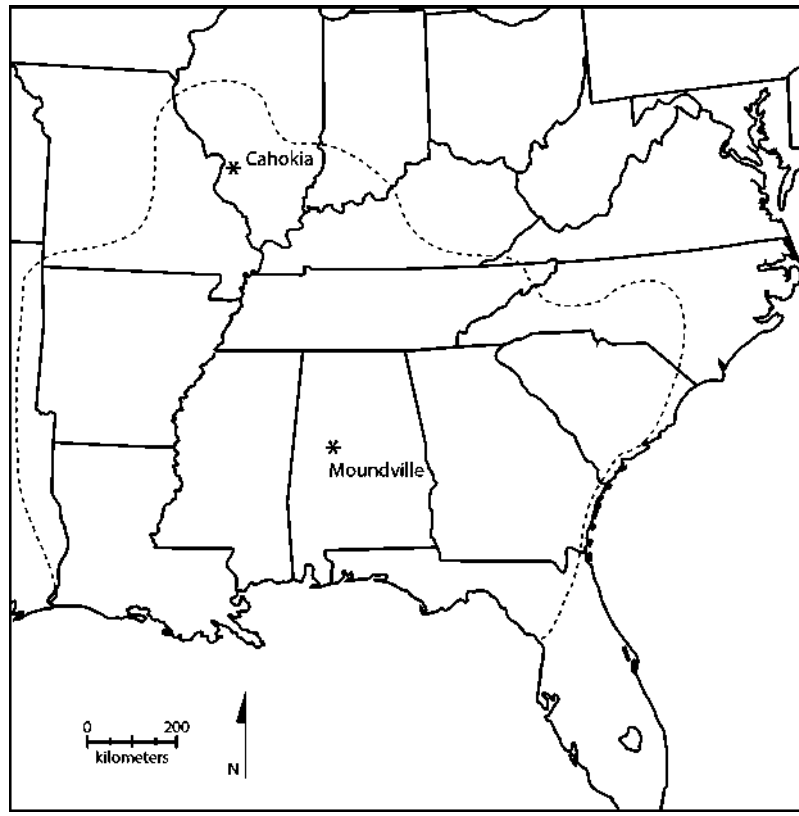
These issues are predicated on the ability of archaeologists to demonstrate, rather than assume, the presence of regional centers that are qualitatively different than other sites in the landscape. There are many social and taphonomic processes that can produce site-size hierarchies, and only some are the material remains of regional centers (Duffy 2015). Researchers have developed analytical tools to more accurately characterize variation in settlement patterns and demonstrate the presence of regional asymmetries (e.g., Peterson and Drennan 2005). Fine-grained chronologies are also critical for demonstrating that large and small settlements were contemporaneously occupied and potentially interacting (Bailey 2007;

Barrier 2017). Once the presence of large settlements is demonstrated, additional analyses are necessary to characterize the social, economic, political, and ideological underpinnings of early regional centers (e.g., Brughmans 2013; Knappett 2013; Quinn and Ciugudean 2018).

Local and Regional Institutions

Early regional centers presented new opportunities and challenges for the people living in and around them. In response to these novel conditions, new institutions – the socially mediated and communally accepted sets of rules for interaction and conduct – developed as means to organize economic, political, or ideological aspects of life. Archaeologists have focused on those institutions that structured the flows of people, resources, and ideas within a region. These include chiefly political offices, religious beliefs and practices, and institutions involved with kinship or identity. Within a chiefdom, for example, the institution of a regional chiefly political office is one way that decisions affecting people throughout a region are carried out. While chiefdoms are normally thought of as hierarchically structured political polities, the decisions of chiefly persona often deal with regional economic matters as well as major aspects of ideology.

Early regional centers did not always support hierarchical institutions but did minimally place important decision-making responsibilities into the hands of certain groups. For instance, sodalities, which are organizations whose members come from several kinship groups, can perform or organize important tasks associated with ritual, key portions of the economy, or political matters. In the Southeastern United States (Fig. 2), for example, the Mississippian settlement of Moundville was constructed around a very large plaza, ringed by several monumental earthen mounds, the summits of which were spaces where elite sodalities or representatives from distinct kin groups carried out tasks that ranged from the crafting of ritual items to processing of human



Early Regional Centers: Evolution and Organization, Fig. 2 Map showing geographic extent of the Mississippian world, with Moundville and Cahokia highlighted

remains (Blitz 2008; Knight 2010). Assuming important ceremonial roles, these groups fueled religious and productive cycles that demanded access to surplus foods, labor for building monuments and ceremonial architecture, and acquisition of the prized materials that specialists crafted into ritually charged items. The most successful may have also taken on roles overseeing important ceremonies associated with death and the afterlife and attendant mortuary practices. Kinship and sodality institutions operating within Moundville's larger regional society were one way that a more politically focused and hierarchical chiefly institution was organized.

Ritual practice and ideologies helped people overcome the new problems associated with living in close quarters (Bandy 2004). In many developed regional centers, archaeologists have recovered evidence for social institutions that operated to maintain a sense of commonality among the various groups that resided at the site. Ideology was important at the Terminal Formative settlement of Tetimpa in Central Mexico (Plunket and Uruñuela 2002). Early on in its history, families would mark their distinctive household compounds with burials to venerate their ancestors. During subsequent phases of growth, more recently arrived families constructed their domestic compounds following the standardized architectural pattern of several domestic rooms around a central courtyard space. Because these new arrivals did not have founding leaders to commemorate, these groups marked their central courtyards with shrines that displayed serpent and feline imagery associated with more widespread and commonly recognized worldviews.

Security and defense were important factors in the development of some regional centers. A village in a defensible location or protected by a strong leader may attract new residents, especially in situations where competition over resources was increasing between multiple villages, or when sedentary groups were seeking protection from ethnically distinct neighbors or in frontier situations. Political leadership may develop when an individual or group can effectively mitigate the negative effects of increasing warfare either through overseeing a larger group of warriors or through managing the construction and maintenance of defensive structures like palisades or other fortifications (Earle 1997). Globally, it has been recognized that warfare intensified alongside the demographic, economic, and institutional changes associated with increased sedentism and the adoption of agriculture (Haas 2001). The ability of leaders or institutions to funnel surpluses into channels for protection, but also to plan and carry out their own raids and acquisitions of new lands, would attract scattered groups from across a region to these new centers. Strength in numbers, defensive structures, and public symbols of success in battle or social violence can also lend a source of ideological power to the groups most associated with success (Earle 1997).

Institutional arrangements in early regional centers were diverse and varied depending on the histories of specific regions. In some cases, new institutions represented novel solutions to extant social problems. In other cases, however, they may have failed to resolve new problems associated with these changing social conditions. The dynamics of early regional centers are thus influenced by broader institutional configurations as well as historically specific events and processes. When archaeologists track the emergence of regional centers over the long term, they are better equipped to understand the trajectories of local and regional histories.

Structure and Organization of Early Regional Centers

Regional centers are part of multiscalar social systems. In fact, the development of regional centers is necessarily linked to the emergence of new scales of human organization. Consequently, understanding the structure and makeup of these settlements – from households to the sites themselves and to their regional settings – requires investigations at multiple analytical scales. Researchers have been quick to note that studying the emergence of regional centers requires an evaluation of the scale at which different organizing processes occur and how organizations at one level do or do not alter organization at other levels (Arnold 1996). Two spatial scales, the site and regional levels, are discussed here.

Intra-Site Scale

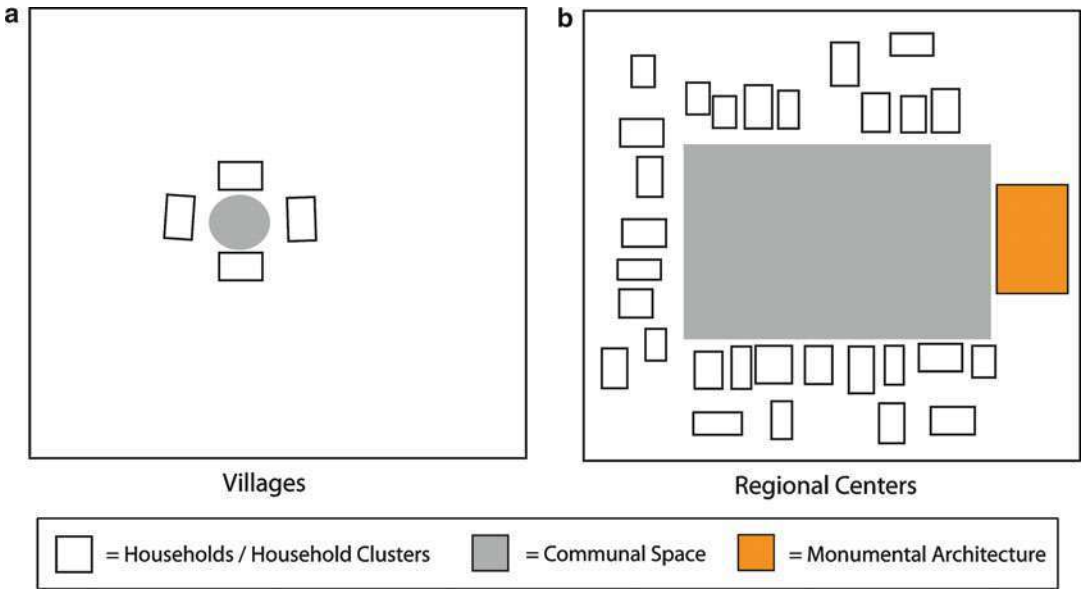
Regional centers contain some of the earliest forms of public meeting spaces and monumental constructions within permanent settlements (Fig. 3). Since people no longer lived solely among their relatives, large plazas, temples, earthen mounds, and pyramids, to mention a few examples, provided spaces for ceremonies, performances, and economic transactions to occur. New forms of architecture, like buildings that served specialized ritual or political functions, are evidence that the institutions necessary for community and regional integration existed. Likewise, the amount of work required to construct large monuments and clear spaces for public plazas demonstrates that several families or regional populations provided labor at a central site.

Regional centers will often have distinct residential sectors made up of multiple families who may have relocated from different settlements across the region through a process of aggregation and coalescence (Kowalewski 2013). Differences between these neighborhoods are sometimes recognizable through material remains, such as variation in house sizes and layouts or the uneven distribution of special foods, exotic goods, or craft items. In some cases, it may be possible to monitor these lines of evidence to identify elite communities in spatially discrete neighborhoods. Elite leadership roles normally develop when regional-level economic, political, or ideological institutions form.

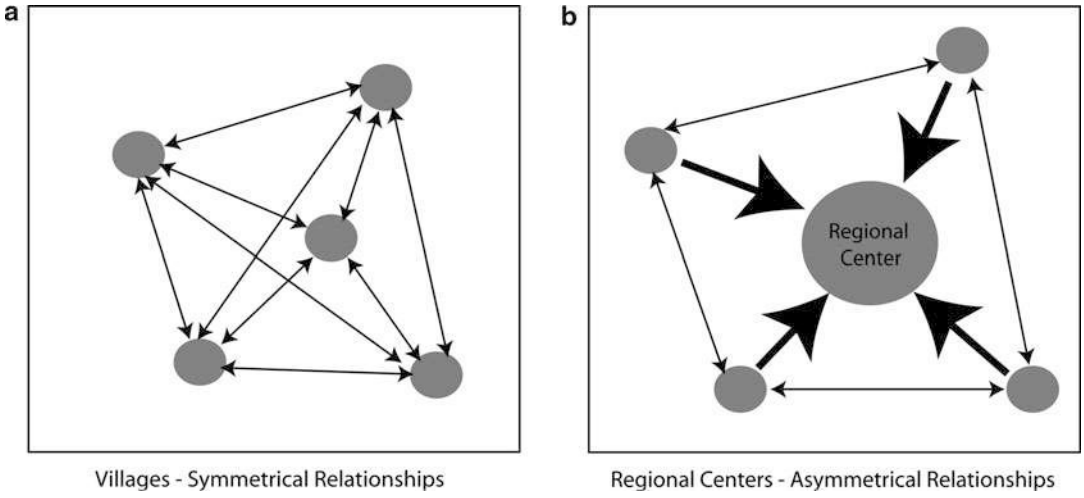
The intra-site configurations of human activity can vary significantly both within and between cultural contexts. For example, the layout of settlement sites in the US Southwest varies a great deal across the region. At Anasazi pueblos, public architecture is often in the form of large kivas, great houses, and plazas (Fish and Scarry 1999). In contrast, Hohokam settlements display ballcourts, platform mounds, and, at Paquime, non-residential effigy mounds. Similarly, there is variability among residential architecture. While Puebloan settlements have highly nucleated room blocks, Hohokam settlements are dispersed with spaces between and within residential compounds.

Regional Scale

At the regional level, regional centers are the most critical settlement in an asymmetric interaction



Early Regional Centers: Evolution and Organization, Fig. 3 Idealized schematic of intra-site organization and interaction in (**a**) villages and (**b**) early regional centers. Population growth, large communal space, and monumental architecture are important characteristics of most early regional centers



Early Regional Centers: Evolution and Organization, Fig. 4 Idealized schematic of regional organization and interaction in (**a**) village-level societies and (**b**) contexts where early regional centers develop. A primary characteristic in the emergence of early regional centers is the development and expansion of asymmetric regional interactions

network involving people in surrounding settlements (Fig. 4). Because this centrality can take on economic, ideological, or political qualities, regional-scale organization can vary significantly.

Prominent settlements that organized key portions of the economy will show material evidence of their elevated economic standing. This could include signs that people in regional centers had greater or privileged access to exotic goods and craft items or maintained storage facilities for surplus foods shipped in from outlying settlements. Regional centers could also have assumed prominence through ideological means and thus become centralized settlements that structure the flow of people and ideas through ritual and religious networks. Archaeologists see evidence for this type of situation when centers contain spaces for ritual performances, buildings for housing ritual specialists and ceremonies, and relatively greater amounts of ritual paraphernalia.

Commonly, central settlements assumed their position through political means. Archaeologists have shown that regional centers are often the seat of elite personnel that asserted political authority region-wide. In a politically centralized system, outlying villages lost autonomy when decision-making power was co-opted by, or transferred to, a prominent leader, a process that has been linked to the emergence of chiefdoms (Marcus and Flannery 1996). Interestingly, studies of chiefdoms from around the world have demonstrated that substantial variation existed even within this type of politically centralized network. This highlights the importance of understanding a settlement system on a regional scale to better understand how political centralization developed and changed through time.

As people became attracted to a regional center's prominence, whether because of primarily economic, political, or ideological reasons, these emerging settlements would grow at the expense of neighboring settlements (Clark et al. 2010). The positive feedback between continued population growth and the regional importance of a center persists until these settlements and their regional networks decline and break apart, or take on new lives as even bigger, urban centers. Thus, regional demographic shifts are necessary components of the study of emergent regional centers (Barrier 2017).

Once regional centers emerged, it was often the case that important leaders developed interaction networks with leaders in centers from neighboring regions. In Mexico, for example, the early centers of San Lorenzo, San José Mogote, and Tlapacoya appear to have engaged in an exchange network of

prestige goods including obsidian, marine shell, iron ore mirrors, turtle shell, and several types of fineware ceramics (Flannery and Marcus 2000). These elite-centric prestige economies may have played a key role in negotiating elite identities across regions as well as the relationships between the elite and the non-elite within the respective settlements themselves.

Trajectories and Dynamics of Early Regional Centers

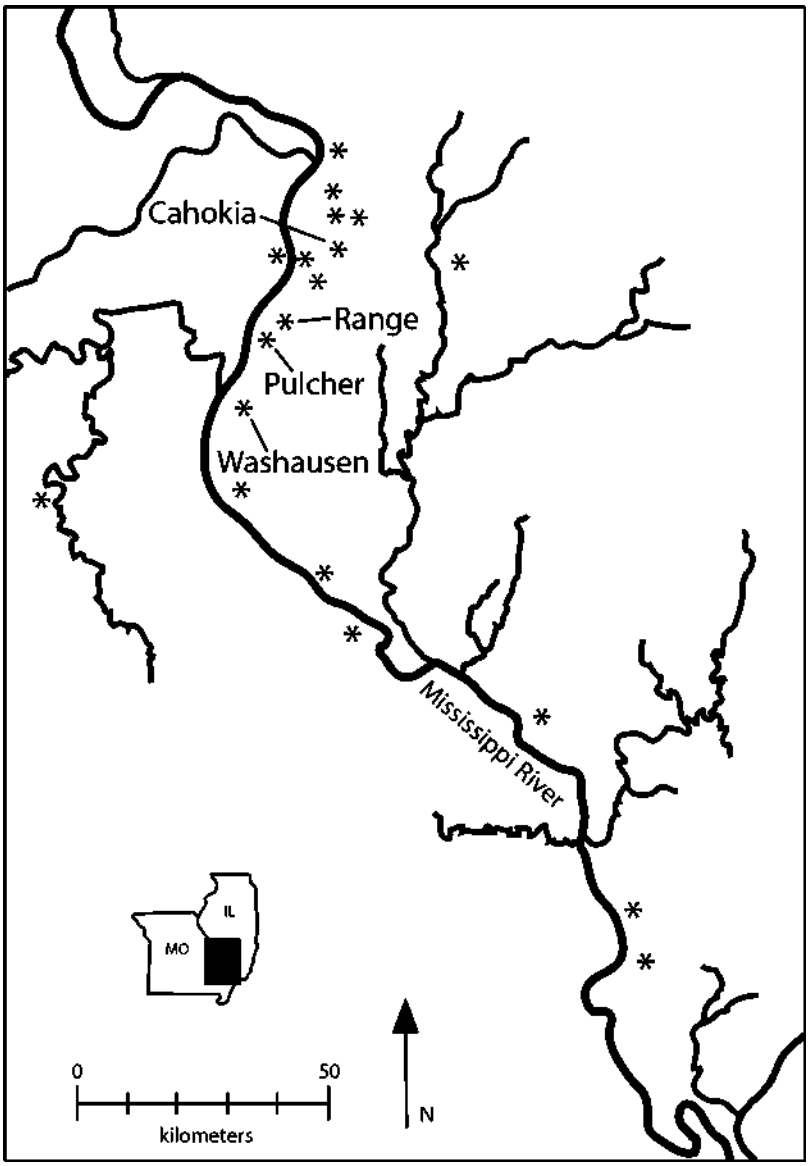
Understanding early regional centers requires investigating the dynamics of social organization prior and subsequent to their emergence. After decades of research, archaeologists have increasingly emphasized that their rates of development and subsequent histories followed a series of different paths, marked by distinct patterns of emergence and change.

Although much of this discussion has focused on the emergence and organization of centers, archaeologists have shown that these settlements and their regional networks changed over time. After a few generations, most experienced significant declines in population, were taken over by other emerging centers, or were abandoned outright. People were not always able to solve the novel problems arising from how these new social contexts were structured. For example, the kinds of social evolutionary changes associated with centralized regional developments only rarely directly led to the changes that spurred the development of social organizational forms like the state. Thus, it may be that the various forms of institutional life that developed with early regional centers often led to other and divergent evolutionary paths (Yoffee et al. 1999).

The prehistoric Mississippian period of the Southeastern United States provides numerous examples of regional center growth and decline (Fig. 2). Across this macroregion from about A.D. 1000 and up through European contact in the sixteenth century, several dozens to hundreds emerged as central nodes that organized regional populations through various means. Some of the earliest developed in the American Bottom portion of the Central Mississippi River Valley, near the modern-day US city of St. Louis, Missouri (Fig. 5). By A.D. 900, a few local villages showed signs of growth as several small family groups moved to these settlements. Although each family group built their houses around small courtyards, it was not until sometime in the tenth century that there is evidence for centralizing public spaces and specialized buildings more indicative of larger and more integrative institutions. The best excavated example of this type of settlement is the Range site (Kelly 1990). At Range, distinct families constructed their own house-courtyard groups around two, small central plazas and a handful of specialized buildings and ritual features. Archaeologists are unsure of the exact mechanisms of integration at this time, but the kinds of buildings, features, and artifacts recovered through excavations hint at the importance of ideological institutions involving new forms of religious symbolism and ritual adherence.

Growth at Range was not sustained, however, as archaeologists have documented a decline in population by sometime in the early eleventh century (Kelly 1990). This population decline appears to have resulted from the fissioning off of several individual family groups that ushered in a reorganization of the settlement newly focused upon only one central plaza. Concurrently, a series of other local settlements appear to have experienced rates of growth and changes unseen at Range (Barrier and Horsley 2014). Sites like Cahokia, Pulcher, Washausen, and a few others have evidence of new, larger-scale integrative social institutions. It is at these settlements during the eleventh century that people in the region first began constructing monumental earthen mounds around large open plazas. Data show that by A.D. 1050 these nucleated settlements served to integrate outlying populations scattered throughout the region living in smaller villages and farmsteads. Again, archaeologists are still weighing evidence to see exactly what kinds of integrative mechanisms were active, but asymmetrical regional networks were in place that served to organize agricultural production and bring together regional populations at centers for large ceremonies and rituals.

By the end of the late eleventh century, however, some of these centers were abandoned,



Early Regional Centers: Evolution and Organization, Fig. 5 Map of the greater American Bottom region showing the location of several Mississippian period settlements, with sites mentioned in text highlighted

others saw continued growth, and even newer regional centers were founded. What is particularly interesting about this example of multiple center growth and decline is that throughout each transformative case of aggregation and dispersal, a more protracted process of larger-scale integration accrued. In fact, the settlement at Cahokia grew so large that it may have been something more akin to an urban center (Kelly and Brown 2014; Pauketat 2009). The institutions structuring the Cahokian society took on a political nature not yet witnessed regionally. Residential neighborhoods at Cahokia were now larger, maintained their own institutional facilities and plazas, and were perhaps aligned according to a settlement-wide grid. The dominating feature of Cahokia was the largest prehistoric monument constructed north of Central Mexico, an earthen mound (named Monks Mound) that eventually stood around 100 feet in height. An extremely large open space marked the central point of the settlement (aptly called the Grand Plaza by archaeologists), which was ringed by smaller mound-and-plaza complexes. However, despite

the fact that Cahokia outpaced neighboring settlements to become the de facto regional center, by A.D. 1200, signs of stress are evident as competition between population segments at Cahokia and throughout the region emerged. By the end of the A.D. 1300s, the Cahokia site and much of the American Bottom region were abandoned.

What this regional case demonstrates is (1) that early regional centers can be centralized along one or more dimensions, (2) that the institutions for integration were often insufficient for long-term and sustained success, (3) that the direct evolutionary development into larger and more regionally integrative centers may not often occur, and (4) that the cultural knowledge of successful and failed institutional arrangements may make it possible for later regional centralization processes to spur the development of more complex organizational formations.

International Perspectives

As a process that occurred in many places across the globe, the emergence of regional centers provides opportunities for cross-cultural comparisons. Identifying the organizational mechanisms, institutions, and tempos by which regional centers emerged and changed through time allows archaeologists to build context-specific models of social, economic, political, and ideological change. Comparing trajectories of the origins and evolution of regional centers allows for archaeologists to identify and better understand the differences between global and local processes.

Tempo of Early Regional Center Development

The tempo of change is a critical attribute of the emergence of early regional centers that varies from case to case. Archaeological research on the emergence of novel forms of social organization has placed renewed emphasis on the importance of chronology, timing, and tempo of human action and systemic change (Prentiss et al. 2009). The emergence of early regional centers in the Americas is an ideal context for highlighting the diversity in tempos of continuity and change in human social systems. Among the numerous ways central settlements can (and do) emerge, two alternative models for the tempo and social context of their emergence are highlighted. These models, linked with specific case studies, underscore the importance of analytical approaches to trajectories of human social organization that are nonlinear, dynamic, and embedded within both human agency and system-level perspectives.

Model 1: Regional Centers Emerge Slowly: A Consideration of Paso de la Amada

In this model, one existing village among many interacting villages gradually assumes a more central role within the regional network. Economic, political, and ideological institutions emerge separately, over a period of time, as the village grows (Lesure and Blake 2002). In Chiapas, Mexico, archaeologists working at Paso de la Amada have suggested this type of development. The village at Paso de la Amada was founded by 1900–1700 B.C. Within the early village, ceramic evidence suggests special-purpose vessels were used for drinking either corn beer or chocolate during festive occasions, and there is evidence that nonlocal obsidian was imported into the site (Clark and Blake 1994; Clark et al. 2010). It was not until almost 300 years after the initial founding of the site that some of the institutional changes in settlement, such as the presence of public architecture in the form of elevated platform mounds and plazas, were seen. Other evidence, from variability in settlement size within the region to differences in domestic house size, location, and complexity, suggest that Paso de la Amada became a regional political center, with some form of inequality. In this case, Paso de la Amada existed for a period of time, with some evidence of centralization emerging throughout the development of the village. Finally, by 1700–1500 B.C., the role of Paso de la Amada within the region had resulted in a qualitative change in its relationship to other villages in the area.

Model 2: Regional Centers Transformed Rapidly: A Consideration of Real Alto

In this model, one existing village within a regional network undergoes significant and rapid

changes in economic, ideological, and/or political organization. Human agents play a vital role in the shift, as an institutional "package" associated with regional centralization is adopted. In this scenario, a more rapid demographic reorganization at the site and regional levels plays an important role in both necessitating and precipitating changes in the institutional mechanisms by which people and communities become integrated. This tempo of development and centralization can be seen at the site of Real Alto along the Pacific Coast in Southern Ecuador. Real Alto was initially settled as a small village around 4400 B.C., but it was not until circa 2900 B.C., when a reorganization of the site layout, regional economy, and demographic distribution quickly changed, that the settlement was transformed (Clark et al. 2010). The emergence of Real Alto as a regional center coincided with a quadrupling in site size, as much as a doubling of on-site population, the construction of a central ceremonial precinct, and diversity in residential structures suggesting the presence of status differences.

Future Directions

Future research into early regional centers will benefit from an investment in three directions:

1. *Theoretical advancements*. Archaeologists can develop additional and more complex models for the emergence and development of early regional centers. These include integrating agency and system-level perspectives and designing research that can better identify and measure processes of institutionalization and interaction.
2. *Methodological advancements*. The study of early regional centers will continue to require a wide range of methodologies. An understanding of the regional context of these types of settlements will be advanced as more data and instruments become widely available and utilized, including the integration of satellite data (such as ASTER) and LIDAR imagery alongside more traditional survey approaches. Geophysical survey, including the use of magnetometry, resistivity, and ground-penetrating radar, may provide minimally invasive and cost-effective methods for understanding the layouts of large settlements and the makeup of regional settlement patterns. The integration of new methodological approaches to artifact studies, including the sourcing of materials through XRF and pXRF, can provide comparative data at both intra-site and regional scales. Perhaps most importantly, techniques for refining and generating more precise chronologies, including more accurate dating techniques, are needed both to ensure synchronic comparisons are warranted and to track diachronic changes in central settlements and their regional networks. The employment of Bayesian statistical methods for modeling site and regional chronologies is significantly aiding archaeologists' abilities to know the timing of historic events (Bayliss 2015).
3. *More case studies and comparative frameworks*. New case studies of early regional center emergence and evolution, designed to integrate multiple scales (from houses to macroregions), are needed. Differing historical trajectories identified with new case studies can be integrated into comparative global frameworks. Comparative projects will allow researchers to discuss early regional centers as a general phenomenon, perhaps with some modal organizational attributes, without requiring that early regional centers all looked the same or were the result of homogeneous social processes.

Cross-References

- ▶ Aerial Archaeology
- ▶ Archaeological Theory: Paradigm Shift
- ▶ Authority and Legitimacy in Political and Social Archaeology
- ▶ Ceramics: Scientific Analysis
- ▶ Chaco Canyon, Archaeology of
- ▶ Dating Techniques in Archaeological Science
- ▶ Demographic Transitions
- ▶ Earle, Timothy

- ▶ Excavation Methods in Archaeology
- ▶ Flannery, Kent Vaughn
- ▶ Fortifications, Archaeology of
- ▶ Marcus, Joyce
- ▶ Mesoamerica in the Preclassic Period: Early, Middle, Late Formative
- ▶ North American Mound Builders: Hopewell, Natchez, Cahokia
- ▶ Processualism in Archaeological Theory
- ▶ Southwest United States and Northwestern Mexico: Geography and Culture
- ▶ Spatial Analysis in Field Archaeology
- ▶ Surface Survey: Method and Strategies
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Early State Formation in China

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Introduction

Until recently, the study of state formation in China has not concentrated on identifying political institutions, social classes, or military expansions common in other regions. As is the case for many other facets of Chinese archaeology, research on the earliest states is one deeply rooted within the traditional historical narratives of China's past. In fact, much of the debate on the earliest states in China still revolves around the identification of markers that denote the development of those cultural elements that can be identified as hallmarks of Chinese Civilization (Allan 2007; Liu 2009; Shelach and Jaffe 2014).

Mostly, the identification of the earliest states in China is one tied into connecting the historical past – a narrative compiled and canonized during the imperial periods and retold for thousands of years thereafter – with the prehistoric remains archaeology has unearthed. Thus, the question of state emergence in China is one traditionally entangled with the development of the earliest

historical dynasties: the Xia (ca. 2070–1600 BCE) Shang (ca. 1600–1046 BCE) and the Zhou (ca. 1046–221 BCE). The rulers of these dynasties are seen as both the founders of government institutions as well as paragons of righteous rule. Since these dynasties, as well as other earlier mythological figures, are believed to have inhabited the Yellow River Valley Plains, they have fostered a view in traditional scholarship where the development of Chinese civilization began in this general area as well. Later it would spread into subsequent regions of modern day China. Consequently, the earliest states and polities are purported to be found in this region as well. Indeed, much of the early archaeological efforts were concentrated here.

Earlier in the twentieth century, the very historicity of the traditional dynasties was questioned, but Li Ji' excavations in Anyang firmly established the Shang as a factual dynasty. Johan Gunnar Andersson's study of the early Yangshao culture (5000–3000 BCE) laid the foundations for the origins of Chinese civilization as he considered it to be the earliest agriculture society in China and as such also the inception point for what would later develop into Chinese civilization (Fiskesjö and Chen 2004).

The missing connection between the early Neolithic communities Andersson found and the later Shang was a problem for Chinese archaeologists, but the 1940s excavations at Chengziya in Shandong, dated to the third millennium BC Longshan culture (ca. 3000–1900 BCE), had finally made that link. The dig yielded a layer of black pottery that could be correlated to ceramic styles from Anyang found in a layer directly under the Shang materials (Liu and Chen 2012: 6–7). In the 1950s, the Erligang culture, under the modern day city of Zhengzhou, was discovered with material culture elements of both bronze and ceramics, which were, stylistically, clear precursors of the Anyang site (aka the Late Shang). Zhengzhou was quickly identified as the capital of the early Shang period. Following these discoveries, many Chinese scholars hoped archaeology would be able to reconstruct more of the traditional narrative recorded in known historical texts and present material evidence proving the existence of the Xia dynasty as well. Then, in the 1960s, excavations at the Erlitou village in Henan revealed a massive site, which predated both the Shang remains of Yinxu and Zhengzhou. It was seen by many as the capital of the Xia dynasty.

Current Debates: Erlitou

Erlitou is a large Bronze Age site located in the Yilou basin of the Yellow River, about 10 km southwest of Yanshi City in Henan Province. The earliest occupation phases at Erlitou date to the Neolithic Yangshao and Longshan periods followed by a 600 year occupational gap. The large Erlitou settlement was established at ~1900 BC and underwent four major settlement phases until 1600 BC when it was finally abandoned. The phase I settlement has been estimated at 100 ha. While the remains of this period have been severely disturbed, a number of prestige items have been unearthed and include ivory and torques artifacts, white pottery, and several bronze tools reflecting an elite element at the site (Liu and Xu 2007: 888). During Erlitou phase II and later in phase III, the site was expanded to its largest extent of 300 ha and its population estimates range from 18,000 to 30,000 inhabitants (Liu and Chen 2012: 270). At the center of the site an architectural complex comprised of 30 structures and platforms has been excavated. Of note are a large compound built in phase II (0.75 ha) and two more built during phase III. Due to their size and design, these structures are identified as important palatial/temple complexes. Elite burials of these phases are associated with most of the same phase I prestige items and bronze vessels. One of the high-ranking burials contained a dragon-shaped artifact, which was made of ~2000 pieces of turquoise and jade (Liu 2009: 226). A group of bronze workshops has been found as well as workshops of pottery, bone, and turquoise.

Even though the very historicity of the Xia dynasty is still a matter of much debate, where scholars outside China see very little evidence to connect the Erlitou site finds to the Xia dynasty (see in Liu and Xu 2007), Chinese archaeology has, nevertheless, generally viewed the Erlitou

site as the manifestation of the earliest state in China. Xia Nai (1910–1985), one of China's first Western trained archaeologists, defined the state as characterized by class differentiation, urban political and economic centers, and the existence of metallurgy and writing. Xia argued that only Erlitou satisfied these criteria (see in Liu 2009: 220–221).

The most detailed argument for the Erlitou site being China's earliest state is presented by Liu Li and Chen Xingcan (2012) who employ Neo-evolutionary models in their research. Their arguments, representing a large part of the current scholarship on early state formation in China, can be summarized as follows: (1) Erlitou is a large site of 300 ha, one of the largest early Bronze Age sites known. (2) Elite bronze ritual vessels were constructed for the first time reflecting state-level symbolic and ideological info-structures. (Bronze vessels would become the containers of authority during the Zhou dynasty and credited their holders with office and political power.) (3) Erlitou was an expansionary state and military controlled strategic locales were set up to extract resources needed to fuel their polity. (4) Erlitou presided over a four-tiered settlement hierarchy of similar material culture sites. (5) The existence of a high elite stratum is reflected by palaces, prestigious items, and burials.

Critique

Not everyone is convinced by the arguments presented above, and critiques revolve around questioning the identification of certain elements as reflecting state-like societies, as well as whether these are in fact their earliest examples in the archaeological record. It is unclear, for example, if the large complexes identified as palaces served as elite residences or administration compounds. In fact, very little can be said about the function of these compounds, as few artifacts have been found in them. While these structures are certainly impressive in regards to both size and planning, they might have served as public buildings or temples and, thus, should not be unquestionably identified as seats of government (Thorp 1991: 14–16). In fact, evidence for elites at the site comes from the excavated cemetery. Yet unlike other prehistoric settlements, Erlitou did not have a separate area of burial and the many unearthed graves (168 in total) were found scattered among its ruins. Most all graves are small or medium in size (1 × 2 m), the majority of which contained no grave goods. Several of the richer graves that were found intact contained artifacts of jade and other hard stones. Some were found with bronzes and others with the remains of wooden caskets (Thorp 2006: 32–33).

Bronze artifacts and ritual vessels are indeed a splendid achievement of periods II–III at Erlitou and evidence for the actual practice of metallurgy is unknown from earlier periods in this region (however, a number of small metal object have been found in Northwestern China dating to earlier periods). Of all the workshops at Erlitou only the bronze workshops were found next to the speculative palatal compound, taken to indicate again the importance of bronze artifacts for the elites at Erlitou and their significance to their power base and status (Liu 2009: 226).

In fact, Allan (2007) views the production of bronze vessels at Erlitou as artifacts crucial for the creation of a cultural hegemony, which empowered elites who controlled and used them. Yet it is only during the subsequent Erligang period (ca. 1600–1350 BCE) when bronze vessels are distributed in vast quantities in far flung regions, that this claim can be forcefully made. The quality and amount of bronze vessels found at Erlitou (17 small drinking cups) is smaller and inferior to the Erligang period sites that number in the thousands. Certainly, for the creation of such a small number of bronze vessels, the Erlitou rulers hardly needed to obtain, let alone control or dominate, the production or trade of copper ore (Shelach and Jaffe 2014: 355–356). Thus, the reconstructions of an Erlitou state ruling a large territory, exacting tribute from its hinterland, and controlling vast lands, resources, and peoples seem to be tangential at best.

In contrast, production at Erligang was centered at Zhengzhou, a large 1500 ha. walled site with bronze foundries found along with a great amount of bronze slag and raw material. Erligang

period vessels are homogenous in shape and character and point to a single site of production. The fact that such a large quantity of bronze vessels was found outside of Zhengzhou symbolizes the spread of the political influence and, more importantly, the spread of a political ideology via a standardized artifact type (Bagley 1999: 156–157).

Longshan Incipient States and Cities

For those following strict neo-evolutionary models for the study of the development of the state and its identification in the archaeological record (themselves not without their problems, see Yoffee 2005), Erlitou does in fact seem to fit the bill, at least partially. Yet other scholars (e.g., Shelach and Jaffe 2014; Campbell 2014) have noted that earlier period sites, notably those of the Longshan period, display the same characteristics that are used to identify Erlitou as a state, the foremost example being Taosi in Shanxi province.

The site of Taosi is the largest Neolithic site found to date in China. Wide pounded earth walls enclosed an area of more than 300 ha (He 2013). At earlier Neolithic sites, stratification is only tentatively derived from the existence of large monuments, but at Taosi a marked separation between elite and commoner is found. During the early phase of the site, its extent was 56 ha, and a palatial section, elite residential area, and cemetery were all separated by internal walls restricting access to them. In its later phases the site grew to a maximum extent of 300 ha. During this period the site was entirely walled and a second elite cemetery was established and separated by an additional wall (He 2013: 261–263).

More than 600 graves were found from the early period and over 80% contained no burial artifacts. Only 1% of the graves can be defined as rich and were found furnished with almost 200 artifacts each, including items such as crocodile skin drums, jade pendants, and copper bells. During the later period the second elite cemetery grew in size, and grave goods of jade, lacquer, and painted pottery vessels were more commonly added to the burial assemblages (He 2013: 266–267). Sophisticated ceramic workshops with attached cooling wells were found along with a number of copper artifacts. Not far, a number of stone workshops were found as well. Recent excavations have suggested that several of the rammed earth platforms were possibly used for ritual sacrifices connected with important dates. Owing to the design and placement of a semicircular foundation of a raised platform and the markings found on it, it is possible that the elite at Taosi were engaged in the practice of solar observations (Pankeiner 2009: 144–145).

Note that the Longshan landscape was dotted with many sophisticated walled settlements, Taosi being one of the largest and best documented of them. Like Taosi, many of these sites displayed complex social organization, class stratification, a proto-urban landscape, specialized craft production, and perhaps even evidence of record keeping and writing. Prestigious items moved at an extraordinary scale both in quantity and distance, reflecting the existence of a complex trade network as well. Elite burials found at Taosi, for example, contained Dawenkou pottery from the east, Liangzhu ritual stone and jade artifacts from the southeast, Qujialing pottery from the south, as well as unique ceramics from the west (Shao 2000: 203).

Future Directions

The archaeological study of ancient states is, to be sure, a debate between minimalists and maximalists. That is to say, it is a discussion that revolves around whether the kernels of social differentiation, economic growth, and technological developments constitute the evidence of the earliest states or rather only their more mature manifestations and developments. In other words, do the Longshan sites of the third millennium BCE suffice our definitions for the earliest states or should we 'postpone their arrival' to the later second millennium?

As noted above, other than minor technological advances, namely bronze production on a small scale, little change can be actually documented at the Erlitou site in comparison to the previous Longshan period. In fact, Erligang period Zhengzhou represents a far larger leap

from previous periods, given its unprecedented size, production scale, and technological advancements (Bagley 1999; Campbell 2014; Shelach and Jaffe 2014). Hence, the continued insistence on Erlitou being the earliest state in China must be seen to reflect a view still rooted in the desire to recognize the Xia dynasty as a seminal stage in the development of Chinese civilization and culture.

More recently, sites from regions beyond the traditional zones of the development of Chinese civilization have begun to shed new light on the formation of states and complex political entities (Xu 2014). The site of Shimao, rediscovered in 2012 in northern Shaanxi province, has revealed massive stone structures and walls encompassing an area of 400 ha (Sun et al. 2017). Impressive guard towers, jade blades, and large public structures represent just some of the extraordinary finds at Shimao. While only a portion of the site has been excavated, if the dates are correct (ca. 2350–1800 BCE), they would make Shimao the largest site in China until Erligang.

The temptation to rush and identify Shimao as China's earliest state has proven too great, and recent publications have, predictably, suggested that Shimao now be seen as China's first state (see in Jaang et al. 2018). While most of these arguments rest on the same neo-evolutionary criteria (namely Shimao's vast size), it is its location, far to the north of the Central Plains, rather than the limitations of these models, that has made the identification of Shimao as China's earliest state difficult for many to accept.

Instead of signaling out a specific site or point in time and debating over the merits of identifying it as China's earliest state – itself an exercise in subjective categorization – what is needed is a study of long-term trajectories of socio-cultural developments, and how they bring about political, social, and cultural change (e.g., Campbell 2014; Shelach and Jaffe 2014; Shelach-Lavi 2015; Liu and Chen 2012; Flad and Chen 2013). Consequently, the unique role social institutions, kinship relations, bureaucracy, government, ritual, and religion have played in the development of complex polities should continue to be a central aspect of scholarship in the study of the development of early states in China (e.g., Chang 1983; Li 2008).

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Earthen Architecture in Archaeological Conservation and Preservation

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Introduction

Earth has been used as a building material for at least the last twelve millennia with the earliest evidence for earth as a building material coming from sites within Western Asia. Later, structures were built using both hand-shaped mud blocks and rammed earth, for example, at Çatalhöyük (Turkey) and Carchemish (Turkey). However, earthen architecture is not restricted to hot, desert climates, and archaeologically and historically, it is distributed throughout the world. From the characteristic "tell," sites comprised of the multiple and varied stratigraphies of abandoned and rebuilt earth structures, through to vernacular, secular, religious, and monumental buildings in urban and rural settings, and earthworks in temperate climates. As such the distribution and variety of earthen architecture and construction spans both continents and millennia with evidence within archaeological contexts and extant structures, alongside still-used earth structures throughout the world.

Definition

The term *earthen architecture* is loosely used to refer to a broad range of structures found in archaeological contexts including earthworks (Fig. 1) and those structures comprised of earth (subsoil) dug from the ground and shaped by the hand or machine and used in a number of different ways – most commonly mudbricks (adobe) (Fig. 2), rammed earth (pise), placed earth (cob), alongside earthen mortars, plasters, and the use of earth within timber-frame structures.

Key Issues/Current Debates/Future Directions/Examples

The identification and excavation of earthen architecture is complex with much anecdotal evidence of archaeologists "missing" earth structures as the material of construction is so very similar to surrounding nonstructural archaeological strata. The failure to identify earth structures during their excavation alongside the poor interpretation of archaeological evidence has a net result that the scale and complexity of excavated earth structures has probably been hopelessly underrepresented.

The identification of earth structures in archaeological contexts has improved with better knowledge of earth as a building material, alongside the application of allied disciplines of remote sensing (aerial photography and geophysical surveying) and ground-based observations (Fig. 3). Moreover, the growing awareness of earth structures in living contexts throughout the world has increased knowledge and understanding of earth as a building material across different disciplines, with archaeologists working alongside anthropologists and engineers (among many others) to better understand performance and significance of earthen architecture.

The longevity of earth structures is dependent on their maintenance through the annual reapplication of protective earth plasters – this occurs most famously at the iconic Great Mosque in Djenne, Mali, where an annual festival involves teams of local masons competing to complete the replastering of the exterior of the mosque. More commonplace everyday maintenance alongside annual repair of earth structures comprises reapplication of surface plasters and recompacting of floors and roofs.

When earth buildings fall out of use, they are no longer subject to maintenance and can rapidly fall into disrepair and subsequently erode, initiating the formation and deformation processes creating the archaeological record. Today, there are many

Earthen Architecture in Archaeological Conservation and Preservation, Fig. 1 Earth-built field monument (Silbury Hill, Avebury, UK). (Photo: D. Powlesland)

Earthen Architecture in Archaeological Conservation and Preservation, Fig. 2 Mudbricks (adobe) (Nisa, Turkmenistan). (Photo: L. Cooke)

social-economic, cultural, and legal reasons for the abandonment of traditional practices of earthen architecture, often in favor of those perceived to embody development and modernity and fit within an industrialized and commercial building industry. The loss of the intangible heritage (rituals, traditions, and local knowledge and practice) of building with earth is one of the greatest challenges for earthen architecture in conservation and preservation. This is particularly as local knowledge, such as sourcing of local soils, is vital for conservation and maintenance in both historical and archaeological contexts.

The material properties of earth-building materials mean that once they are abandoned or exposed through archaeological excavation, the greatest threat is their erosion as a result of exposure to the damaging effects of weather. Damage as a result of falling water, rising water, and (among many others) freeze-thaw results in the characteristic erosion patterns found on most archaeological examples of earthen architecture. The combined effect of moisture on earthen architecture is erosion to the surface, base, and walls. Rising water, alongside salt crystallization, results in erosion to wall bases, and surface erosion at wall tops results in the

Earthen Architecture in Archaeological Conservation and Preservation, Fig. 3 Earth walls exposed through differential drying (Hili 17, Al Ain, UAE). (Photo: D. Powlesland)

Earthen Architecture in Archaeological Conservation and Preservation, Fig. 4 Earth-built monument with characteristic erosion at the wall base (Great Kyz Kala, Merv, Turkmenistan). (Photo: L. Cooke)

characteristic "upside-down carrot" appearance of upstanding walls (Figs. 4 and 5).

Erosion is also caused by vegetation; animal, insects and birds; and human-induced loss such as agricultural damage, theft, inappropriate development, and a failure to valorize (and thus protect) local vernacular heritage. Given contemporary geopolitical tensions, earth structures have also been damaged as a result of human conflict in Mali, Iraq, and Syria.

Debate is still ongoing as to the best means of conserving, presenting, and managing earth structures. Given the material qualities of earthen architecture, the essential conservation in situ can be complex, and a number of approaches for protection from the damaging effects of weather have been used.

In those contexts where conservation "as found" is preferred (and "seeing" original archaeological and historical earth structures is stressed), numerous materials for consolidation have been used. In other cases, the use of shelter structures to protect exposed earthen architecture from the damaging effects of weather (primarily falling water and wind damage) is preferred (Fig. 6). In other cases, original archaeological and historical

Earthen Architecture in Archaeological Conservation and Preservation, Fig. 5 Characteristic appearance of excavated and exposed earthen architecture (Hili 14, Al Ain, UAE). (Photo: D. Powlesland)

Earthen Architecture in Archaeological Conservation and Preservation, Fig. 6 Earthen architecture conserved through shelter structures (El Brujo, Peru). (Photo: L. Cooke)

earth structures can be backfilled using appropriate separation layers to ensure the protection of the original fabric in situ (Fig. 7). Other approaches to conservation of earthen architecture can include reconstruction and restoration. As such, the approaches adopted for the conservation of earthen architecture can pose significant practical, ethical, and philosophical challenges.

Many of the approaches to the conservation of earth structures have been developed since the 1960s, initiated by projects in the Middle East under the auspices of ICCROM and the universities of Turin and Pennsylvania (among many others). These approaches are largely consolidated within the proceedings of the series of conferences organized by ICOMOS and now known as ISCEAH (International Scientific Committee on Earthen Architectural Heritage). The most recent in the series of conferences, Terra 2016, the 12th International Conference on the Study and Conservation of Earthen Architectural Heritage, was held in Lyon, France. There are numerous individuals and

Earthen Architecture in Archaeological Conservation and Preservation, Fig. 7 Conservation backfilling of excavated earth structure (Merv, Turkmenistan). (Photo: L. Cooke)

institutions involved in research into the various different aspects of earthen architecture around the world.

Since the 1970s, significant emphasis has been placed on better understanding of the seismic performance of earth structures, with lessons learned from structural engineering for new buildings with earth transferred to historical buildings and earthen architecture in archaeological contexts, alongside understanding of empirical ancient systems and techniques. The development of better knowledge and practices appropriate for earthen architecture for retrofitting in advance of, and repair in response to, seismic events has been prompted by the damage to earth structures following earthquakes in Bam (Iran) and in Peru, Turkey, China (Sichuan), and the USA.

Currently, there is a growing awareness of the needs to better understand and respond to the complex effects of climate and ongoing changes as a result of climate change. For example, more frequent extreme weather events such as flooding or extreme diurnal and annual temperature and humidity fluctuations will have a significant negative impact on the survival of earthen architecture.

The interplay between heritage and sustainability is well demonstrated by current research into earthen architecture. Significant research is being undertaken to understand and promote the use of earth as a low-carbon (and environmentally friendly and responsive) building material. This is important as raising awareness and increasing the profile and status of earth as a building material is widely acknowledged as the best way in which earthen architecture can be retained in different contexts around the world. As such, the research undertaken in new build contexts is important in influencing the retention of both tangible and intangible heritage of earthen architecture around the world.

The conservation and preservation of earthen architecture have proved itself to be immensely complex. There is evidence of repair and maintenance from archaeological contexts from the early uses of earth structures. Today, the ongoing development of multidisciplinary approaches to the material will significantly aid our understanding and response to complexities faced throughout the twenty-first century.

Cross-References

- ▶ Authenticity in Archaeological Conservation and Preservation
- ▶ Bam: Archaeological and Social Investigations after the Earthquake
- ▶ Conservation and Management of Archaeological Sites
- ▶ Conservation and Preservation in Archaeology in the Twenty-First Century

▶ International Council on Monuments and Sites (ICOMOS): Scientific Committees and Relationship to UNESCO
▶ Near East (Including Anatolia): Origins and Development of Agriculture

Further Readings

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The Earthen Mounds (*Cerritos*) of Southern Brazil and Uruguay

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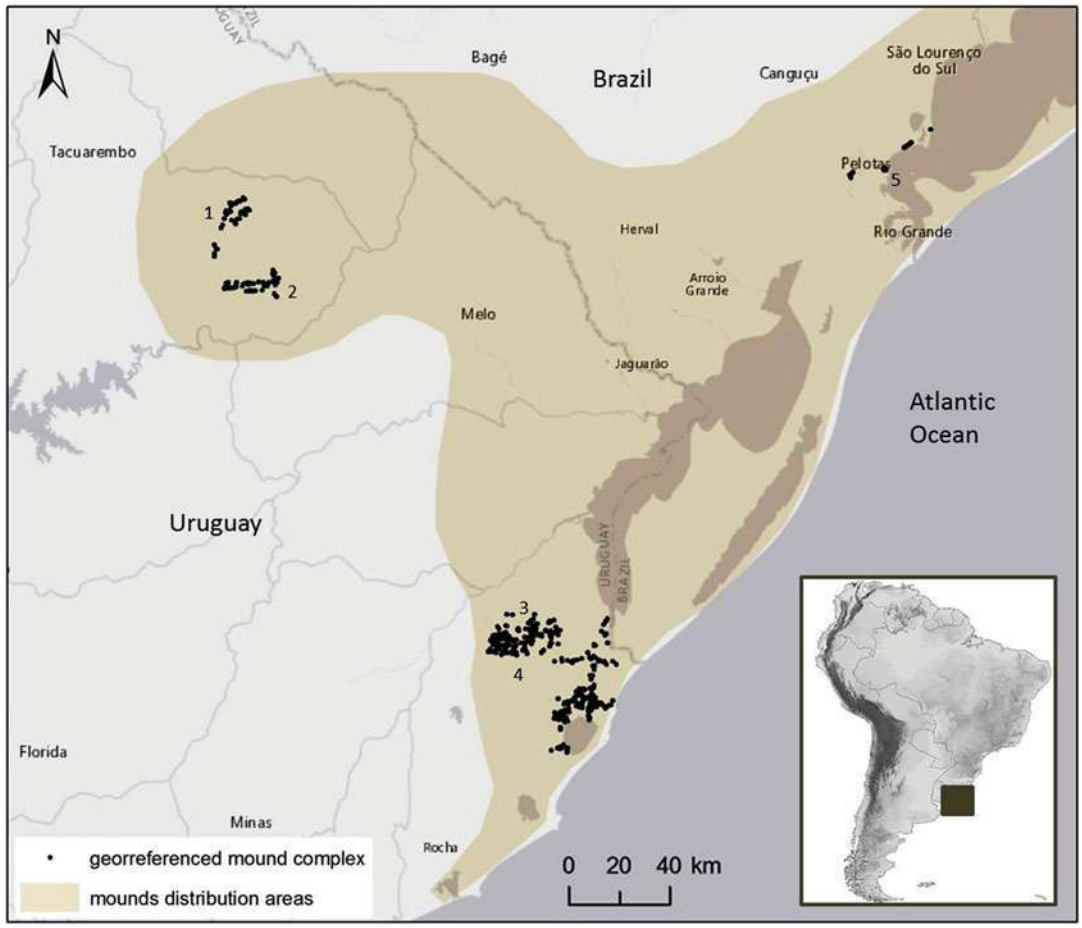
State of Knowledge and Current Debates

On the southernmost lowlands of South America, there are earthen mounds studied since the nineteenth century and known as "*aterros*" or "*tesos*" (in Portuguese) and "*cerritos de indios*" (in Spanish). These sites, comprised predominantly by earth, are articulated to other built structures as microreliefs (mounds with less than 30 cm in height), elongated platforms, borrow pits, tracks, pathways, and artificial lakes that compose archaeological complexes situated in flooded environments in the Pampa biome, among Uruguay, Argentina, and southern Brazil. The Pampa biome is located in the lowlands of South America among the Atlantic coast on the East, the Atlantic Forest biome on the North, the Grasslands of Argentina on the West and South. This bioma is part of the provinces of the Paraná-Paraguay basin with approximately 750,000 km^2, within the South Temperate Zone, and has both subtropical and temperate climates with four well-characterized seasons. Grasslands, with sparse shrub and tree formations, are the dominant vegetation. The average temperature in the biome is 18° and the climate is warm and humid (Roesch et al. 2009). The archaeological studies have surveyed more than 1500 earthen mounds in a wide polygon encompassing the low Paraná and low Uruguay rivers, plus Jacuí, Vacacaí and Ibicuí river valleys, the middle Negro river, and the basin of Patos and Mirim lagoons (see Figs. 1 and 2) (Bracco et al. 2005; Bonomo et al. 2011; López Mazz 2001, 2010; Cabrera 2013).

The *cerritos* are earthen mounds comprised by anthropic soils with polished and knapped lithic instruments, faunal and botanical remains, ceramic shards, and sometimes human remains. These archaeological structures dated between 4700 and 200 years BP and are found both isolated or in clusters – up to a hundred in number – upon the landscape. Their spatial distribution, although it occurs in environments of different altitudes along flat and undulating terrain of the lowlands, is always linked to edaphic units as flooded and swampy environments regionally known as "*banhados*" and "*charcos*" (Bracco et al. 2000, 2008; Gianotti 2000; López Mazz and Bracco 2010; Bonomo et al. 2011) (see Figs. 3 and 4).

Definition

The category of *cerritos* includes a wide variety of sizes and architectural structures that require more studies to be precisely defined. However, in general terms *cerritos* has been defined as



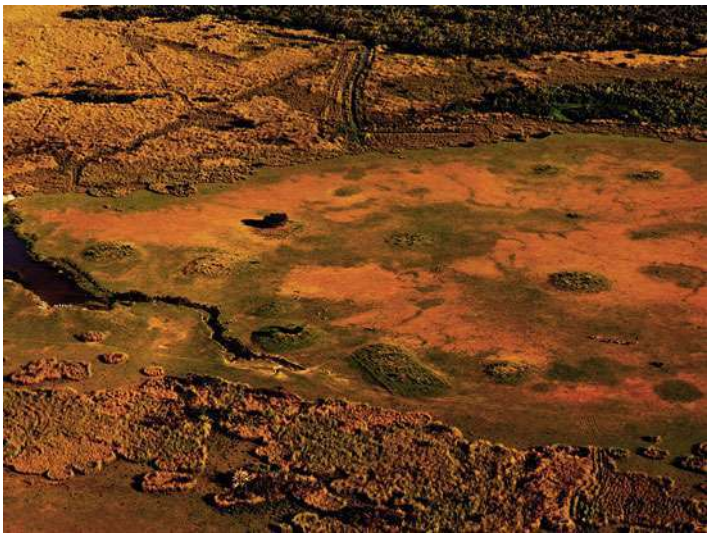
The Earthen Mounds (*Cerritos*) of Southern Brazil and Uruguay, Fig. 1 Map of cerritos in southern lowlands of Brazil and Uruguay, pointing out the mentioned areas in the text: (1) Yaguari valley, (2) Caraguata Valley, (3) India Muerta wetlands, (4) Los Ajos site, and (5) Pavão 01 site in the basin of the Patos lagoon as well as the Pampa biome in South America

archaeological structures built with mostly earth, but containing also other materials, located in wetland environments in the Pampa biome. They are comprised by anthropogenic organic sediments deposited in planes whose diameter oscillates between 30 and 60 m. Their height varies from just a few centimeters to more than 7 m and their chronology reaches as far as the mid-Holocene (Bracco et al. 2000, 2005; Iriarte 2006; López Mazz 2001).

In the northeast of Uruguay, at the valleys of *Yaguarí* and *Caraguatá* streams, there are sites with elliptical or elongated dimensions that vary between 70–150 m along the major axis and 25–40 m in the minor axis (Gianotti 2004, 2005; Gianotti and Bonomo 2013). Inside regional clusters, architectonical diversity appears in the same space forming a very heterogeneous complex of sites. There are even cases of earthen structures in a "ring" format, and even in a "boomerang" shape, suggesting the association between two different mounds after an earth moving, as in the case of *Los Ajos* and *Pago Lindo* (both in the lowland of Uruguay) (Fig. 5) and the Pavão 01 (in the basin of Patos lagoon, Brazil) (Fig. 6) (Gianotti and Bonomo 2013; Iriarte 2006; Bracco et al. 2008; Milheira et al. 2017).

The mounds are distributed along clusters containing several of them around the streams and the wetlands, or occurring isolated on the top of the hills. Larger clusters can contain as many as a hundred *cerritos* within it, while the

The Earthen Mounds (*Cerritos*) of Southern Brazil and Uruguay, Fig. 2 Round mound (cerrito) in the India Muerta wetlands, Uruguay



The Earthen Mounds (*Cerritos*) of Southern Brazil and Uruguay, Fig. 3 Aerial partial view of a Lussich mound complex located in Yaguari valley, Uruguay

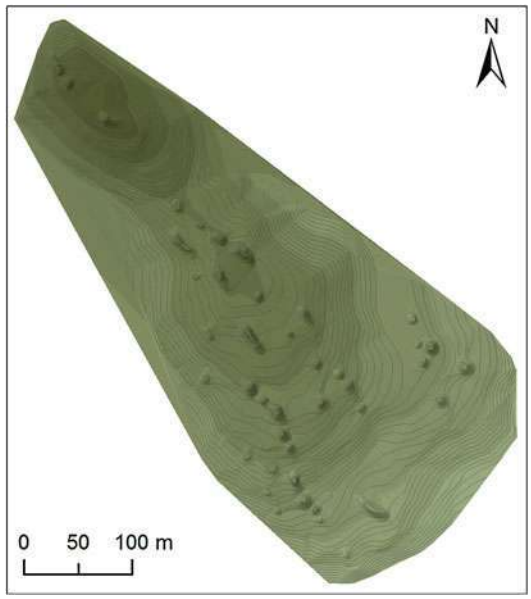
smaller ones have only two to three mounds cerritos (Bracco et al. 2000; Gianotti 2005; López Mazz and Pintos 2000).

The oldest *cerritos* are situated in the Uruguayan territory, at the wetland of *India Muerta* wetland and along the tributaries of the *San Luis* river, which led to the proposition that this cultural phenomenon would have started in this region and then expanded to other lagoon and coastal regions (Bracco et al. 2005; Gianotti 2015). That expansion would coincide with the stabilization of the sea level around 2500 years BP, which gave the actual shape to the lowlands, allowing the formation of new continental areas available for human settlement (del Puerto 2015; Bracco et al. 2000, 2005). Also, the highest *cerritos* can be found in the region of *India Muerta*, such as *La Viuda* and *Isla de Alberto*, measuring 7.20 and 6.40 m, respectively (Fig. 7).

Key Issues and Current Debates

Since the nineteenth century, the lowland prehispanic architecture of southern Atlantic has caught the attention of many researchers. The *Cerritos* was firstly interpreted as burial mounds in comparison with Mississipian mounds (Arechavaleta 1892; Figueira 1892). Years later, Ferrés (1927) argued that the *cerritos* were,

indeed, domestic spaces resulted from adaptive ways of living in flooded environments. That theory would be reaffirmed in the 1970s with the first and widely spread theoretical model that consider the *cerritos* as settlement areas occupied systematically by indigenous people in a high mobility social system. According to Schmitz (1976), the *cerritos* of Patos lagoon were fishing campsites focused on lagoon exploitation occupied mainly in springer and summer.

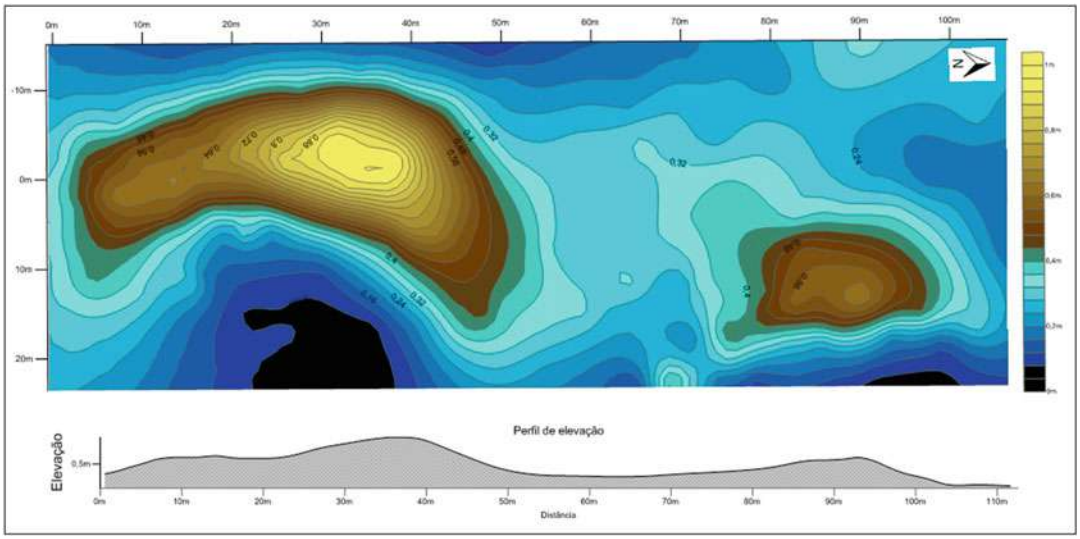


The Earthen Mounds (*Cerritos*) of Southern Brazil and Uruguay, Fig. 4 Digital Terrain Model (MDE) of Lemos mound complex in Yaguari valley, Uruguay

The material culture of these mounds would corroborate such an interpretation. In the case of ceramic technology, the evidence shows preeminence of simple shape ceramic vessels inferred as "utilitarian ceramic" that served to prepare fish – the base of the diet of those indigenous people. The pottery would have been used in an speed up way without the necessity of technological and/or aesthetical improvements of the vessels, characterized through reduced firing, thin walls, high frequency of sandy temper, and vessels of small and medium size of simple shape that would define the "Vieira tradition" (Schmitz 1976). The lithics were mainly made with bipolar techniques using local raw materials as different varieties of quartz. It was also interpreted by the same functionalist view, which the technological simplicity would corroborate the inference of a pattern of expedite use linked to the manipulation of gathered plant resources, fishing, and hunting practices (Schmitz 1976).

The systematical reoccupation of the same places where were built the *tolderias* (huts made

The Earthen Mounds (*Cerritos*) of Southern Brazil and Uruguay, Fig. 5 Ring-shaped mound in Paso de los Ladrones complex mound located in the Caraguatá valley, Uruguay



The Earthen Mounds (*Cerritos*) of Southern Brazil and Uruguay, Fig. 6 Topography of site Pavão 01 with "boomerang" shape associated mound, located in the basin of Patos lagoon, Brazil

The Earthen Mounds (*Cerritos*) of Southern Brazil and Uruguay, Fig. 7 *Cerritos* in Talitas mound complex located in the wetlands of India Muerta, Uruguay

with a straw roof and wooden posts) should generate an accumulation of sediments as well as disposed materials. In this way, the height and volume of *cerritos* would be related to the number of reoccupation and, consequently, to its age. In short, *cerritos* were inferred as archaeological remains raised passively by "hunter-gatherers bands," resulted from "seasonal occupations." Such groups would belong to "marginal tribes," owners of a "simple technology," very "dependent on the environmental resources" and with a "highly mobility system" (Schmitz 1976).

However, this functional paradigm started to change after the 1980s, when a new interpretive model based on an ecological-adaptive perspective allowed to see the mound builders societies as groups of complex hunter-gatherers of high efficiency. These groups usually lived in a high productive environment with an economic organization based on the seasonal optimization

of different environments engaged in a cycle of year round mobility (López Mazz and Bracco 1994). In this context, the *cerritos* were mainly interpreted as burial sites, whereas the presence of *cerritos* in the sierra could not be explained by the same logic of those situated in the flooded plains. Just after years of research, evidencing archaeological remains as postholes, house floors, reassembly of ceramics, and so on became possible to recognize that the *cerritos* were, indeed, built for multiple functions as living spaces used continuously and, occasionally, also used as cemeteries (Gianotti 2005; Iriarte 2006; López Mazz and Bracco 2010).

In this way, the *cerritos* would not have been the result of seasonal and occasional occupations raised passively as consequence of a wide system of mobility. Actually, these mounds would have been built as planned earthen structures resulted from funerary activities (López Mazz 2001, López Mazz and Bracco 2010), domestic areas (Bracco et al. 2008; Gianotti 2005; Iriarte 2006), and multifunctional spaces, used systematically to live, to bury, and to crop (Villagran and Gianotti 2013).

According to López Mazz and Bracco (2010), during almost 5000 years of history, the mound builders have experimented profound changes in social and economic aspects that coincide with the wide range of domesticated and transformed spaces. Their population would have grown in demography; the settlements would have multiple in quantity and function (seasonal, circumstantial, semi-permanent) and would have display a larger internal complexity (as domestic spaces, ceremonial platforms, and planting and disposal areas). In general, these changes and the consequential territorial adjustments can be observed on a large scale over 2500 years BP, as well as the creation of new settlements in different regions, what suggests a process of colonization of other areas (Bracco et al. 2000, 2005; López Mazz 2001).

The management and use of native and domesticated vegetal resources as maize (*Zea mays*), squash (*Cucurbita* sp.), beans (*Phaseolus* sp.), tubers (*Canna* sp. and *Calathea* sp.), and palm nuts (*Butia odorata* and *Siagrus romanzoffiana*) – especially after 2500 years BP, but more intensively after 1600 years BP – would have allowed new economic practices (Iriarte 2006; del Puerto 2015; del Puerto and Campos 1999; del Puerto and Inda 2008). It also allowed the occupation of new settlements, the emergence of new productive spaces in the territory (Gianotti et al. 2013), and the origin of new forms of social and political organization (the *chieffdoms*) (López Mazz and Bracco 2010). Also, between 1000 and 800 years BP, the evidence of built areas for farming in specific mounds dedicated to maize cultivation (Gianotti et al. 2013).

The first mound builders groups explored a wide range of animal and vegetable resources through hunting, fishing, and gathering. From 2500 years BP, there are traces of animal specialization in hunting – cervids and a small rodent as the *Cavia aperea* – coincident with some incipient experiences of domestication and farming (Moreno 2014). Changes in economic strategies and in the resources management, according to Moreno (2014), would have been connected with transformation in territorial property and general resources management. Pottery technology was another important improvement originated around 3000 years BP that reflected new ways of processing, cooking, consuming, and stocking the food. The lithic technological system reinforces the progressive loosing of regional mobility, characterizing an expedite technological production based on local raw material (Gascue et al. 2009; López Mazz 2001; Iriarte and Marozzi 2009).

Along the last period, there was a process of territorial contestation materialized in distinct forms of social appropriation of the territory, based in the ascendency and ancestrally. Since 1600 years BP the *cerritos* become ceremonials. The funeral burial practices of different human individuals inside the same mound become generalized (Bracco et al. 2000, 2005), involving, eventually, the presence of domestic dog (*Cannis lupus familiaris*) (Moreno 2014) within the burials. These funeral practices coincide with a variation in the standards, including, at least, three patterns of inhumation: primarily burial, secondary burial (in packs), and burial of isolated skeletal parts, such as cranium, fingers, legs, and ribs

(Pintos and Bracco 1999; Femenías et al. 1990; Gianotti and López Mazz 2009). These isolated human bones buried appear sporadically, associated and mixed to the sediments of constructive material that comprises the mound and are common that they have cut marks or even burning traces on them (Gianotti and López Mazz 2009; Figueiro 2004; Moreno 2006; Moreno et al. 2014; Pintos and Bracco 1999). These findings illustrates the discussion about ritual cannibalism, a question that needs more systematic information and case studies to be precisely understood and addressed (Gianotti and López Mazz 2009; Moreno 2006).

Concomitantly, the internal growing of mound clusters presents a regular pattern indicating communal spaces for public activities (*plazas*) as well as constructive events that increase height and resistance, transforming some *cerritos* in monuments. New smaller earthen structures seem to develop, articulated to domestic activities also used for crop, situated in the margin of sites (López Mazz and Gianotti 1998; López Mazz 2001; Iriarte 2006). That space formatting of the settlement, according to Iriarte (2006), is in line with the increase in political activity and the consolidation of the community as an organizational structure. The micro- and macroregional clusters of mounds clearly denote a process of constant landscape fragmentation as strategies for resources management as well as social and territorial control. "This process illustrates one of the first and clearest steps in the intentional building of a 'territory' (. . .) with the geographical space economically managed, symbolically marked, politically delimited and socially defended" (López Mazz and Bracco 2010, p. 257).

With regard to historical continuity, the *cerritos* situated in Brazil and Uruguay were interpreted as mounds built by Charrua and Minuano native groups (Serrano 1946; Basile Becker 2002). On the other hand, in the Argentinian Delta of the Paraná river, the *cerritos* were probably built by the Chaná-timbú people (Bonomo et al. 2011). Charrúa, Minuanos, and Chaná-timbú are indigenous groups historically known by abundant reports of travelers and chroniclers from the sixteenth century. However, for Uruguayan and Brazilian lowland areas, this ethnographical correlation is not consensual for two reasons: (1) according to López Mazz and Bracco (2010), it would be coherent to assert that the region of the Patos and Mirim lagoons, as well as the northeast of Uruguay – the main dispersion area of the *cerritos* – would have been occupied only by Minuano groups, the traditional enemies of the Charrúas. (2) It is always dangerous, from a historiographical point of view, to extrapolate colonial historic and ethnic categories to the long-term prehispanic past, making simple analogies with a society with approximately 5000 years of history (Basile Becker 2002; López Mazz 2001).

In sum, in the last 25 years of archaeological research, interpretations were matured that allowed to think the *cerritos* not more like archaeological remains resulted from "simple hunter-gatherers societies," but as "monumental structures" built by "complex fishers, hunter-gatherers, and agriculturalist societies" agents of a long-term history that encompass domestication, building, and control of the *Pampa* landscapes. Belonging to groups extremely articulated to flooded environments, practitioners of an economy involve fishing, hunting, gathering, production, and management of plant resources, as well as complex ways of managing both wild and domesticated resources, what characterizes as a "mixed economy" (Iriarte 2006; del Puerto 2015; Gianotti 2015; Moreno 2014). These earthen-engineered buildings, besides referring to other manners of landscape contestation and as evidence to a community way of life, would contemplate the mythic memory and the millenary history of mound builders as structures that aggregated people, reflected social hierarchies, demarked landscapes, and materialized the territorial reclamation. In this way, the *cerritos* must be understood as political phenomenon that comprises ideological landscapes and can be thought as generational monuments (that refers to the past, to the present, and to the future of mound builders societies), orientational monuments (that mark territories and landscapes and helps the individual circulation through the lands), and ontological monuments (that congregates cosmologies and historical

myths) (Bracco et al. 2000; Dillehay 2000; Gianotti 2000, 2005, 2015; López Mazz 2001, López Mazz and Bracco 2010; Cabrera 2013; Pintos 1999).

Cross-References

- Agricultural and Social Earthworks in the Guianas
- Anthropogenic Sediments and Soils: Geoarchaeology
- Earthworks of the Amazon
- Earthworks of the Llanos de Mojos
- Geometric Earthworks of Western Amazonia
- Mound Building, Social Complexity and Horticulture in the Lower Paraná River
- Recent Advances in the Archaeology of the Southern Proto-Jê People

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Earthworks of the Amazon

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Introduction

Amazonian Indians have been leaving marks of their activities for the last 13 thousand years. In this long history of interaction, significant marks were printed in the territory. Here will be presented a series of positive and negative topographical modifications that, in some cases, after millennia of its construction, still remain visible.

These anthropogenic and long-lasting topographical modifications will be classified as "earthworks." The term encompasses different categories of structures, with distinct functionalities, not necessarily related in time and space.

Definition

Earthwoks are positive (when there is an accumulation of earth) and negative (when the earth was dug out) topographical interventions done by people in the past with sufficient intensity to be recognizable today. In the Amazon, Earthworks include different categories of structures with distinct features, most commonly related to water management, aquatic wildlife management, mobility, defense, human burials, housing, and cultivation. Several authors mention that, among the functions of these structures, are the imposition and demonstration of regional chiefs power in networks of precolonial political relations in ancient Amazonia.

So far, the identified categories are: residential and funerary mounds, funerary chambers, raised fields, ditches, moats, geoglyphs, wells, canals, roads, paths, and dams.

Residential and Funerary Mounds

In South America, there are several examples where the association of earth mounds and occupation sites has already been verified. Mounds or platforms associated with residential structures have been documented in Suriname and Guyana (Rostain 2008; Versteeg 2008), in Ecuador (Salazar 2008; Masucci 2008; Rostain 2008), in Colombia (Oyuela-Caycedo 2008), in Peru (Pozorski and Pozorski 2008), in Uruguay (Iriarte et al. 2004), and in the llanos de Mojos area of Bolivia (Prümers 2014); in Brazil they have been documented in Marajó Island, at the mouth of the Amazon (Meggers and Evans 1957; Roosevelt 1991; Schaan 2012), and in the Pantanal region near the headwaters of the Paraguay river. These contexts range from preceramics sites, such as the *cerritos* of Uruguay, to sites associated with deposits of the so-called Barrancoid Series in northern South America. In some cases, as in the Brazilian examples cited above, the construction of mounds seems to have had a practical function, since the sites are in seasonally floodable areas.

In other cases, like in Central Amazonia and in Ecuador, the mounds were built in flood-free areas, suggesting that in addition to the practical functions there may have been some symbolic reasons for building these platforms.

The first archaeologists to work on Marajó island considered mound building societies of Marajoara phase as completely different from other Amazonian populations classified as *Tropical Forest Culture* by Robert Lowie in 1948 because of the sophistication of the ceramics they produced, but mainly because they build mounds with ceremonial and residential purposes (Schaan 2012).

Marajó mounds are known locally as *tesos*. They were usually built with the surrounding sediments with the addition of layers containing archaeological objects during subsequent construction events.

Archaeological research has suggested that two types of *tesos* existed: residential and ceremonial. Residential *tesos* are always associated with complexes containing one or more ceremonial *tesos*. Ceremonial *Tesos* are preferably implanted where secondary water courses meet the main rivers and they were built of naturally elevated levees of Holocene age (Fig. 1).

Schaan (2012) suggests that normally only one longhouse with the size of 30 × 20 meters was built on the top of each large teso, even if their surface areas were much larger, ranging from 1100 m^2 for the smaller mounds and 13,500 m^2 for the largest and varying from 2 to 8 meters in height.

It is necessary to consider that there are controversies about the formation process of the Marajó mounds. In Santa Luzia, which has an elevation of about 20 m, researchers have identified that only 2.5 m of the structure can be attributed to human action. Another example, from the 8 m of the Teso dos Bichos site (Roosevelt 1991), only the first 4 m showed evidence of anthropic

Earthworks of the Amazon, Fig. 1 Teso dos Bichos mound, Marajó Island, Brazil. (Photography: © Wagner Souza e Silva. © Antiga Amazônia Presente (amazoniantiga.tv.br))

activities. Therefore, mound builders would have taken advantage of the elevated features naturally present in the landscape.

The construction of the *tesos* were related to a complex system of water and aquatic fauna management, and it is possible that even parts considered by Rossetti and his collaborators as natural were in fact managed during the construction of the channels.

In Suriname, Boomert (1978) describes elevated structures associated with dwelling areas near raised fields dating from between 700 and 900 CE. In this case, mounds were necessary for occupants to have a flood-free surface in the middle of their raised gardens. The largest of the residential mounds reported by Boomert is about 200–320 m in diameter and about 2.5 m in height.

At the mouth of the Negro River, near the present city of Manaus, several archaeological sites present mounds (in Portuguese these structures are known as *montículos*) constructed with accumulation of earth and ceramic fragments. These structures measure about 20–30 m of length by 10–20 m of width and have between 1–3 m of height. The most important sites in the region exhibit large amounts of these *montículos;* the mounds were elevated platforms on which the houses were built. At Hatahara site, about 20 mounds were identified.

Archaeological research associated these *montículos* with Paredão phase, dating from 700 to 1300 CE. The mapping of different archaeological sites has shown that mounds were always placed in a circular or semicircular position, which represents the distribution of the houses inside villages (Fig. 2).

Unlike the previous examples, in the region of Manaus mounds were built in areas that are permanently free of flooding, even during the most severe floods.

Dozens of burials were recovered in excavations on some of these *montículos*, demonstrating that they may have been concomitantly used as residential structures and cemeteries, as it is not uncommon among contemporary Amazonian populations who bury their deaths inside their houses.

Earthworks of the Amazon, Fig. 2 Hypothetical reconstruction of a ring village during the Paredão phase (1200 CE) with houses built on platforms (*montículos*). Reconstruction based on topographic data from Antonio Galo site, Iranduba, Amazonas, Brazil. (Graphic art by Marcos Brito Castro)

Mounds can reach up to 2000 m^2 in the Manaus area (Moraes and Neves 2012). On a much smaller scale, it is possible to perceive a process very similar to that identified in the Marajó island, where places chosen for building the mounds were already naturally elevated parts in the settlements.

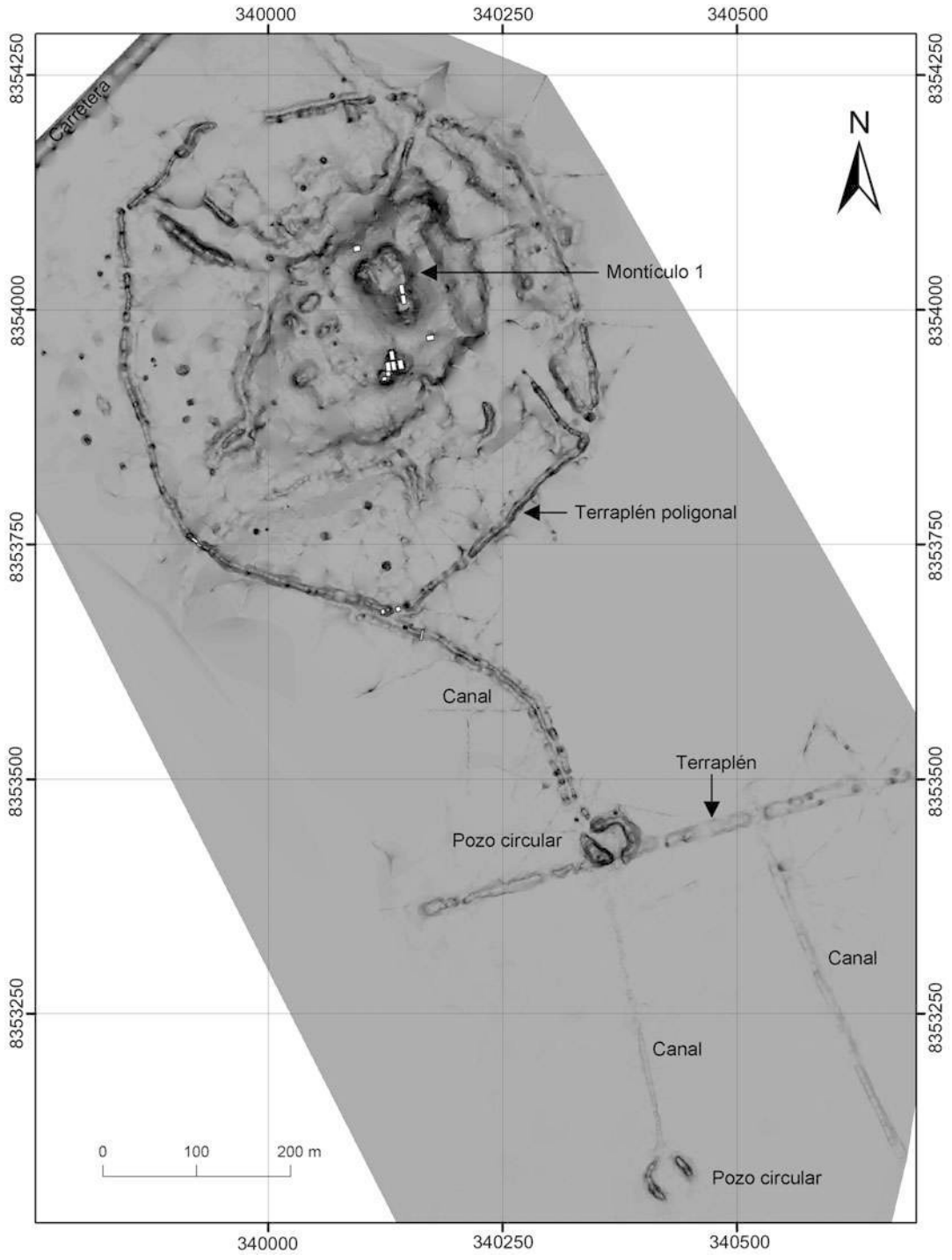
In Bolivia, in the region known as Llanos de Mojos, in a large seasonally flooded area, mounds are documented in proportions similar to those found on Marajó island (Fig. 3). Such large land platforms, locally known as *lomas*, began to be built around 500 CE and continued being erected until around 1400 CE. Throughout 800 years of occupation, these platforms were used for various domestic and rituals activities. Archaeological work undertaken in these sites mention the existence of cemeteries with hundreds of individuals buried directly in the ground or in large ceramic funerary urns. In addition to the cemeteries, the *lomas* were also used as residential platforms where a varied range of domestic activities, such as processing of fermented beverages, fauna management, and tool making, were documented (Prümers 2014). As in the case of Marajó, these mounds are also associated with a series of other earthworks that will be described below.

In the Upano valley of the Ecuadorian Amazon, not far from the Andes, hundreds of earth mounds were built between from 500 BCE and 600 CE along alluvial terraces above the high flood levels. Upano mounds had a spatial pattern composed by a square or rectangular, low, and flat plaza surrounded on four sides by mounds, modified slopes, banks or pathways. In several complexes, a central mound was built in the center of the plaza with four or six peripheral elevations (Rostain 2008; Salazar 2008). Moundbuilind was abandoned after the eruption of the neighboring Sangay volcano, whose record can be seen in the regional stratigraphy.

Raised Fields

These earthworks have been documented in various parts of the Amazon, but the largest concentrations were found in the Bolivian Llanos and the coastal areas of French Guiana and Suriname, normally in association with residential mounds (Erickson 2006; Rostain 2008). Raised fields include platforms of varied forms, as well as the adjacent flooded channels, where a varied range of plants were cultivated. In both Bolivia and the Guianas, they were built on areas of seasonally flooded savannas (Fig. 3).

Building technique consisted in the construction of mounds of varied forms (squares, rectangular, oval, elongated), with great variation of number, height, and size. According to the information



Earthworks of the Amazon, Fig. 3 Loma Mendoza site, Llanos de Mojos, Bolivia, where it is possible to observe a mound (loma) and several other structures such as wells, canals, and embankments. (Source – Prümers and Jaimes Betancourt. 2014). (Courtesy of Carla Jaimes Betancourt)

gathered from the archaeological surveys, smaller fields may have been about 50 cm in length with 30 cm in height, while the largest had tens of meters in extension and up to one meter of elevation above the water level. Hundreds of hectares were cultivated using this technique.

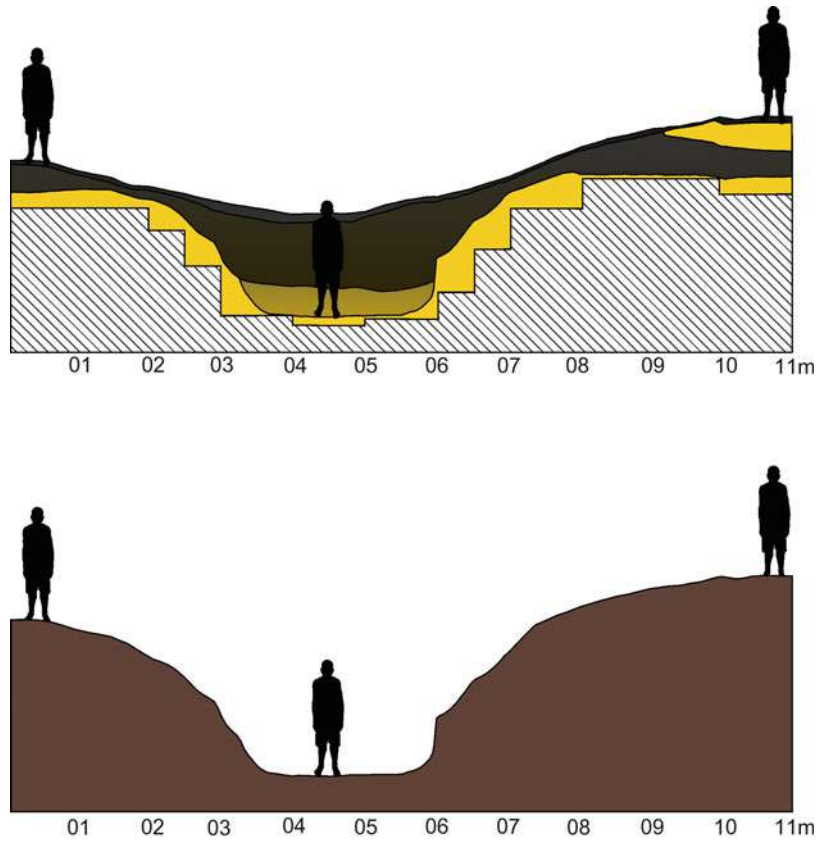
In the Guianas, raised fields began to be constructed around 650 CE and could be dated until 1400 CE (Rostain 2008). In addition to the construction of elevated fields, a composite network of canals, dikes, and dams was built to deal with impoundment and drainage of water as well as with the aquatic fauna of these environments (Erickson 2006). New layers of organic matter were periodically added to the raised fields to ensure their continuous fertility.

Ditches

Associated to the Paredão and the Axinim phase occupations in the vicinities of Manaus and the lower Madeira River, respectively, there are structures whose construction demanded considerable labor mobilization. In the Vila Gomes site, in the lower course of the Madeira river, a trench with about 1100 m length by 15 m wide and 3 m deep was dug around 1.000 CE. Near the mouth of the Negro river, in places where mounds were also documented, trenches with proportions similar to those observed on the Madeira River were also documented in several sites (Moraes and Neves 2012). In these cases, archaeological research suggests that the purpose of the construction would be defensive (Fig. 4).

Alfred Métraux (1942) documents similar structures among the villages of the Baure Indians in Bolivia. "Baure villages were surrounded by palisades with loopholes for archers, and a ditch; for further protection pitfalls were concealed in the paths.".

Defensive trenches are also found in the upper Xingu region associated with precolonial Arawak



Earthworks of the Amazon, Fig. 4 Cross-section of a defensive trench of 1100-m long (1000 CE) Vila Gomes site, Borba, Amazonas, Brazil. (Drawing – Claide de Paula Moraes)

occupations (Heckenberger 2005). According to Heckenberger, the trenches of the upper Xingu were excavated in the surroundings of the ancient villages, mostly semicircle or raised linear mounds forming a continuous curb defining the edges of circular central plazas. The excavated trenches are about 1–4 m in height, 15 m wide, and up to 2.5 km long. The raised ones can reach up to 2 m in height. Radiocarbon dates suggest that in the Xingu, these earthworks were built between 1250 CE and 1350 CE.

Similar geometric features are found on hundred hilltops in the extreme north of Brazil, in the Amapá state, as well as in French Guiana and Surinam. In this case, the archaeological sites are known as "crowned mountains."

Geoglyphs

In the southwestern Brazilian Amazon, mainly in the State of Acre, hundreds of sites were formed by the reshaping of tons of sediments, forming circular and/or quadrangular geometric features defined as geoglyphs (Fig. 5). In the same region, in neighboring countries, especially in Bolivia, contemporary sites with similar features are defined as Zanjas (Erickson 2006).

In some cases, these geometric structures can be connected by lowered or elevated paths recognizable by the movement of earth involved in their construction. In minor frequency, these geometric features were also found in positive topography, as in the case of the Espinhara site.

According to, geoglyphs are found mainly in interfluvial regions and on plateaus tops. It is not uncommon that one of the quadrants is placed near a spring or a periodically flooded area. Some of those sites were formed by one or more geometric structures, sometimes associated with mounds and bermed roads. The trenches forming the circular geoglyphs are about 11 m wide, with the depth varying between 1 m and 4 m and diameter between 100 m and 200 m. The quadrangular structures have approximately the same dimensions. It is common that two parallel trenches were dug to define the geometric shape.

Schaan suggests defensive and/or symbolic religious functions involving the construction of geoglyphs, since few objects are normally found in them. Currently there are more than 500 of such structures found in Amazonas, Acre, and

Earthworks of the Amazon, Fig. 5 Double moated square geoglyph – Purus basin, SW Amazon. (Photo Mauricio de Paiva)

Rondônia states in Brazil, as well as Beni province in Bolivia. Although most of these sites have been found because of the increasing deforestation taking place in SW Amazonia, a recent study shows that at the time of their construction, which peaked at the first millennium CE, there is no visible evidence of the intense use of fire and of deforestation associated with geoglyphs (Watling et al. 2017).

Wells

On the top of the Belterra plateau in the Santarém area at the mouth of the Tapajós River, there are structures dug in the ground known as wells. Associated with archaeological sites from the late Tapajonic occupation (1000–1700 CE), they were documented since the 1920s by Curt Nimuendajú (2004). These artificially dug structures are mainly elongated or circular, with the borders raised by the addition of the internal sediment excavated (Figs. 3 and 6). A layer of clay was described in the bottom of these wells and probably had a waterproofing function. Their diameters range from 15 m to 30 m and their depth between 1 m and 3 m. Little has been researched regarding the function of these structures. However, the main hypotheses are related to water and aquatic fauna storage (Troufflard 2016).

Paths, Roads, Canals, and Dams

Often the different societies of the Amazon are referred to as "the people of the waters." In fact, until today one of the main means of getting around in the Amazon is using the huge network of rivers and lakes that drain the region. A considerable part of the Amazon basin is composed of plains or hills with very small elevation in relation to sea level. Manaus, distant 1100 km west of where the Amazon river meets the sea, is only 40 m above sea level. This immense plain, associated to the gigantic drainage basin and the large quantities of rain that falls annually in the Amazon, create flooded savannas, rivers with many meanders, and a complex chain of lakes

Earthworks of the Amazon, Fig. 6 Well at an archaeological site in the Belterra plateau, Pará, Brazil. Some of the wells like this one are still efficient to retain water, even in the dry season. (Photo courtesy of Anderson Marcio Amaral Lima)

and lagoons. The seasonal variation of floods is very significant. In the port of Manaus, floods and drains of the Negro River have been being monitored for more than a century. The average difference between the peak of the flood and the ebb is about 10 m. In extreme periods, this difference has reached more than 16 m.

This seasonal difference significantly transforms the landscape. Rivers, meanders, navigable lakes are connected in one season but become isolated bodies in another. Flooded plains (*varzea*) and savannas become extensive dry prairies in the dry season.

The long history of human occupation of the Amazon shows that its inhabitants have learned to control and manage these different landscapes. The mounds described above were in many cases raised to provide surfaces free from floods. But the dry period also required handling. In Marajó, Bolivia, on the coast of the Guianas and in several other places, the settlements became distant from the waterways in the dry season. In these places, canals, dams or even roads were constructed to provide means of transport, water supply, aquatic fauna, and irrigation or drainage of agricultural fields.

In Bolivia, according to, causeways were constructed with the sediment removed from the construction of channels and could reach up to a meter of elevation, 6 m wide and several kilometers in length. The channels followed approximately the same proportions and could have been used for transportation in small boats. Hundreds of other structures have already been documented connecting rivers to each other or linking settlement areas, forest islands, and raised fields.

In Marajó, Denise Schaan (2008) mentions the existence of artificially constructed canals connecting one settlement to the other (Figs. 1 and 3). The construction of dams would prolong the period of water supply and fishing during the dry season.

In both cases, these earthworks are chronologically associated with residential and funerary mounds.

Several human settlements have been documented in areas far from the great rivers of the Amazon. In the region of Santarém, in the same plateau where Curt Nimuendajú (2004) mentioned the presence of wells, the same author mentions the presence of several kilometers of roads connecting the settlements to each other and these with the banks of the Tapajós River.

Elevated or lowered roads are also mentioned connecting geoglyphs or ditches in Acre and Bolivia (Schaan 2012; Prümers 2014).

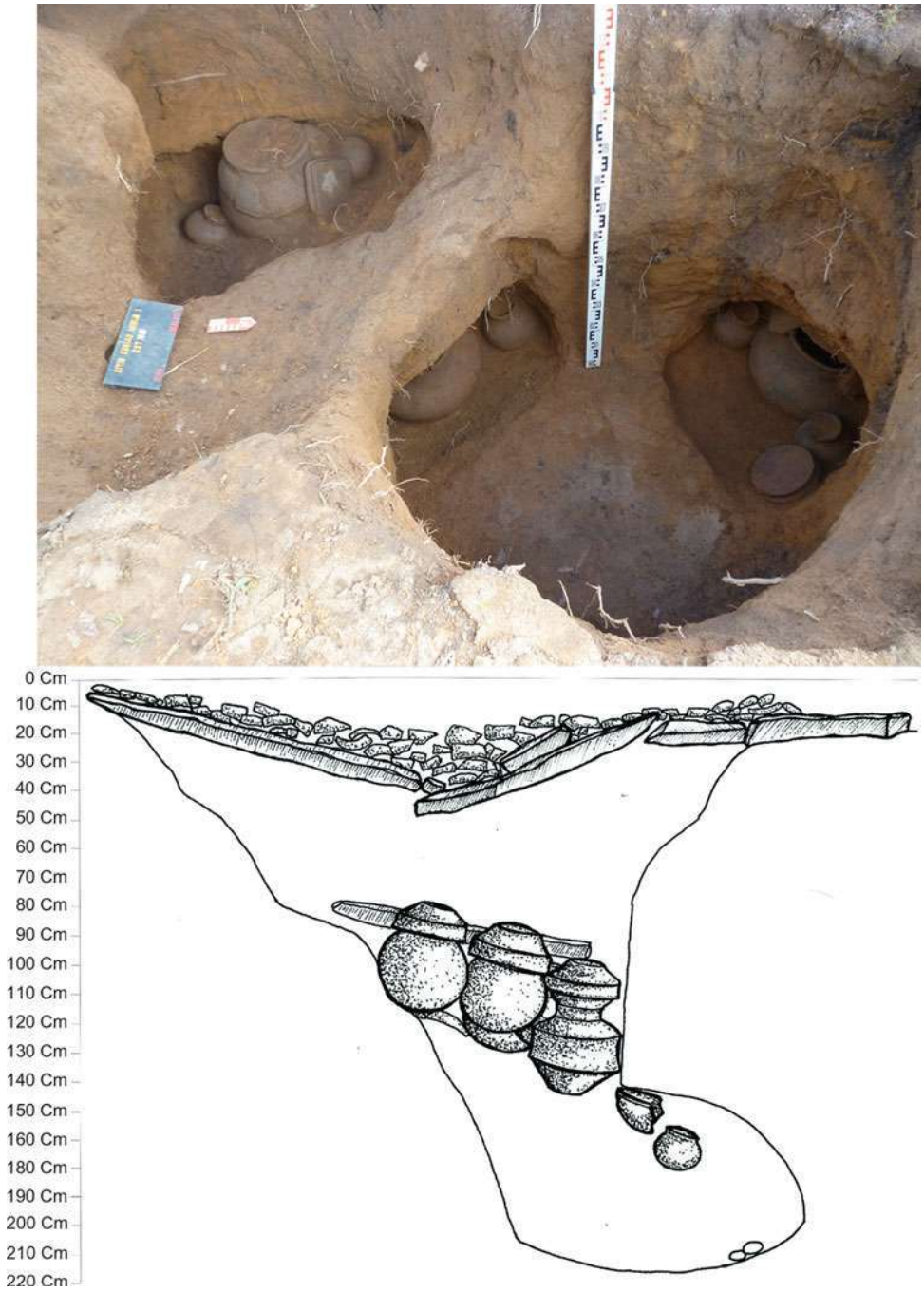
Funerary Chambers

Unlike the other categories of earthworks, funerary chambers are sometimes difficult to perceive in surface surveys. The funerary pits are underground chambers shaped like a boot (a cylindrical well with a chamber in the shape of a quarter of a sphere) (Fig. 7). A funerary pit documented by Emilio Goedi was about 1 m in diameter and 2.5 m deep. Within these chambers, there were richly decorated funerary urns associated with the Aristé phase, dated around 1.000 CE. These chambers were used for successive funerary events, in some cases with clear disturbance of the previous burials. Most of these burial chambers are marked on the surface by large granite plates weighing more than one tonne and some were placed vertically while a second plate served as a burial chamber cover. These constructions can be found individually or in large groups, such as the Rego Grande site in Calçoene, Amapá, where several aligned stones disposed circularly marked chambers with various funerary urns.

Archaeologists mention that in addition to marking the funerary pits, some of the aligned stones mark astronomical events such as the solstices (Saldanha and Cabral 2010).

Historical Background

The earliest mentions of earthworks in the Amazon are related to the chronicles of the first Spaniards who descended the Amazon River in 1542. The friar Gaspar de Carvajal is the first to mention the existence of roads connecting the settlements on the banks of the Amazon River with other settlements of the mainland.



Earthworks of the Amazon, Fig. 7 Funerary chambers at the Curiau Mirim site, Amapá, Brazil, where it is possible to observe the borders of holes with the urns and the funerary accompaniments (photo). Profile of a funerary chamber on the CA18 site, Amapá, Brazil, showing the limits of the chamber, the granite plates used as cover, urns, and funerary accompaniments. (Photo and drawing – courtesy of João Saldanha)

The advances of the colonizing settlements lead several missionaries and scholars (naturalists) to have contact with several archaeological sites in the Amazon. Earthworks, as the Marajó *tesos*, were first excavated by Charles Frederick Hartt in 1871. From 1948 to 1950, Betty Meggers and Clifford Evans excavated a number of tesos and stone alignments around the mouth of the Amazon (Meggers and Evans 1957).

In 1905, the Swiss zoologist Emilio Goeldi presented the first descriptions of the funerary chambers of Amapá.

One of the main pioneers in documenting earthworks from the Brazilian Amazon was Curt Nimuendajú. In the 1920s, he identified and researched the Marajó *tesos*, documented several of the alignments of granite slabs that mark the funerary chambers in Amapá. In Santarém, he was the first to mention the existence of the wells and the roads that connected the old settlements and the Tapajós river (Nimuendajú 2004).

One of Nimuendajú's contemporary and a sponsor of his researches on Amazonian ethnology and archaeology was Erland Nordenskiold, who was also the first to work and document the Llanos de Mojos earthworks in Bolivia around 1910 (Erickson 2006).

The mounds near Manaus were first recorded by Peter Hilbert in the 1950s, but systematic surveys in these earthworks were only carried out from the 1990s, with the Central Amazon Project coordinated by Eduardo Neves. Claide Moraes directed many excavations on these mounds as well as on the trenches at the lower Madeira river.

Acre geoglyphs, although recorded by Ondemar Dias since the 1970s, were only observed and recorded from the sky in the 2000s, when Brazilian palaeontologist Alceu Ranzi spotted them on a commercial flight to the city of Rio Branco (Schaan 2012). Denise Schaan, Mati Pärsinnen, and Sanna Saunaluoma performed excavation in several of these sites.

The mounds on the French Guiana Coast were excavated by Stéphen Rostain, who established their anthropic origin, as well as by Aad Versteeg.

Earthworks of Bolivia were first identified by William Denevan and later excavated and mapped by Clark Erickson, Heiko Prümmers, Carla Jaimes Betancourt, John Walker, and Eduardo Machicado.

The first Spanish explorers who descended the Amazon River also mentioned the existence of fortified villages with palisades and trenches, but mapping of defensive trenches at archaeological sites is the result of recent research that were intensified by the use of precision tools for the production of topographic maps of archaeological sites.

Key Issues

Most of the earthmovers had disappeared before any contact with Europeans, who produced the first written documents which can be translated and used in current scientific research. In this way, these large constructions challenge researchers in the attempt to understand their technology of construction, the necessary manpower, and the time spent to build them. More so since in the precolonial Amazon there is no evidence of metallurgy, the artifactual set used for solving all the tasks of this period involved mainly tools constructed with wood, bones, carapaces, horns, and a varied range of rocks and minerals. To make things even more difficult, of these materials, only stone tools are easily preserved in the Amazonian archaeological record.

Much of the earthworks were built around the year 1000 of our era. There is an intense debate in Amazonian archaeology pointing to this period as being the one with the highest population density before present times and that it reached an extremely high level of political complexity and relations of power in the Amazon. Often earthworks are mentioned as an example of the magnitude of human action in precolonial Amazon. Understanding the particularities involved in their construction becomes then a key issue for this debate.

International Perspectives

The Amazon rainforest occupies a large portion of South America. According to the current political geography, the territory is distributed in nine countries. The importance of the Amazon and its conservation is fundamental for entire life on the

planet. Understanding the history of human occupation in this region and how the relationship between the environment and people provided what we know as the Amazon rainforest today is an important step in thinking about what will be the future of this region. The study of earthworks is an important step in this process of understanding.

Future Direction

Remote sensing, paleoecological analyses using micro-vestiges such as phytoliths, starch grains, and the use of experimental archaeology are research topics that are growing in Amazonian archaeology; the development of these areas will be fundamental to broaden the understanding of earthworks in the Amazon.

For instance, when the GOOGLE provided free high-definition images of various parts of the Amazon, the number of new geoglyphs recorded in deforested areas of the Acre region increased exponentially (Schaan 2012). Although not very accessible, due to the application costs, the use of LIDAR is very promising for the identification of new earthworks, even in areas with dense vegetation cover (Prümers 2014).

Paleoecological analyses were able to identify some of the plants that were grown in the raised fields of the Guianas (Rostain 2008). A paper by Jennifer Watling and collaborators has recently been published (2017), analyzing micro-vestiges of sediments collected from geoglyph excavations in Acre and attempting to reconstruct the landscape in which these earthworks were constructed. The results show that the geoglyphs were constructed in an area with dense vegetation and low deforestation, but in forests with intense management for at least the last 6 thousand years.

Using a real time GPS tracking, the Kuikuro Indians of the upper Xingu mapped tens of kilometers of paths and trenches in an ethnoarchaeological project led by Michael Heckenberger (2005). Heckenberger's work has shown that earthworks delimit precolonial villages which are much larger than historically documented ones.

Clark Erickson (2006) and his team have been producing very informative data to understand the technology of construction and use of raised fields with the construction of experimental raised fields in Bolivia.

Moraes and Neves (2012) used experimental archaeology parameters to think about the necessary workmanship and the time spent to construct the defensive structures of the Madeira River region.

And finally, in South America there is an increasing interest in archaeological studies, a growing number of young people are seeking training in archaeology. Increasing the number of researchers is key to identifying new archaeological sites and perhaps new categories of earthworks.

The association of these different research strands is very promising for the future study of earthworks in the Amazon.

Cross-References

- ▶ Aerial and Satellite Remote Sensing in Archaeology
- ▶ Aerial Archaeology
- ▶ Amazonian Dark Earths: Geoarchaeology
- ▶ Anthropogenic Environments, Archaeology of
- ▶ Earthworks of the Llanos de Mojos
- ▶ Geoglyphs
- ▶ Geometric Earthworks of Western Amazonia
- ▶ Landscape Archaeology
- ▶ The Earthen Mounds (*Cerritos*) of Southern Brazil and Uruguay
- ▶ The Guianas: Pre-Columbian Heritage
- ▶ The Hunter-Gatherers' Riverine Mound Builders from the Brazilian Atlantic Forest in the Southeast

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Earthworks of the Llanos de Mojos

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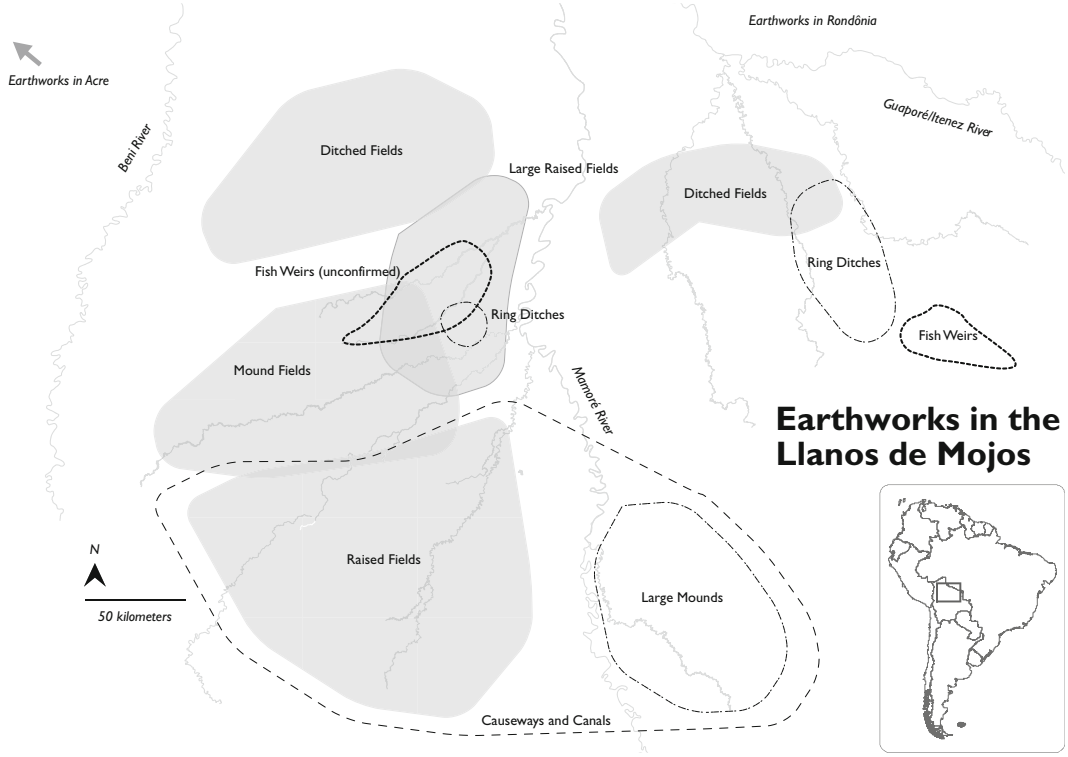
State of Knowledge

Introduction

The Llanos de Mojos (or Mojos) is a seasonally inundated tropical savanna, about 140,000 km^2 in extent, located between the Beni, Mamoré, and Iteñez/Guaporé Rivers, in the Bolivian Amazon. Long recognized as the setting for complex archaeological cultures, in the early 1960s, Mojos became better known as an example of an anthropogenic landscape in the Amazon and in the Americas. Countering expectations that tropical forest environments determined that Amazonian societies had always been nonagricultural, and small in scale, the earthworks of Mojos made it clear through their extent, diversity, and monumentality that Mojos did not conform to these larger expectations.

The documentation of these earthworks was part of a larger trend examining pre-Columbian anthropogenic environments in Mexico, Colombia, Venezuela, the Guianas, Chile, Brazil, and as far north as the US states of Georgia and Wisconsin (Denevan 1966, 2001). These landscapes (of raised fields and other earthworks) have changed the general impression of how pre-Columbian societies interacted with the environment, at different scales. The question is reversed, to ask to what extent Amazonians in particular and pre-Columbian communities in general changed the environment to suit their purposes (Erickson 2008). But as the necessary resources to study earthworks



Earthworks of the Llanos de Mojos, Fig. 1 Location of different types of earthworks within the Llanos de Mojos, in reference to South America

(such as satellite imagery) enter the public domain, a third possibility is engaging more scholars: that these landscapes may reflect cultural concepts that do not categorize and divide nature from culture in the same way that geographers, anthropologists, and governments have done (Fig. 1).

History of Study

Despite some excellent early sources on the indigenous peoples of Mojos, beginning in the Jesuit period, historical records of earthworks are very sketchy (Eder 1985; Metraux 1942). There is little information before the arrival of the Jesuits in the 1660s, and in later sources, Nordenskiöld is the first eyewitness to ponder the extent and origin of Mojos earthworks (1913). Among the observers of the 1960s, William Denevan stands out, for his excellent monograph which brings together the available historical and geographic knowledge, and includes careful documentation of earthworks both on the ground and from aerial photography (Denevan 1966). This book is the starting point for all geographic and archaeological research on Mojos.

Beginning in the 1980s, a generation of archaeologists began to answer Denevan's call for more research, and some details of chronology and archaeological association have now been developed. These archaeological efforts have recently been reviewed (Erickson 2006; Prümers and Betancourt 2014; Walker 2008b).

An important source of information on earthworks and the landscape comes from open access satellite imagery, which as of this writing can be accessed through several platforms including Google Earth and ArcGIS Earth. This imagery, while it varies in precision and accuracy, represents an expanding historical record of landscape change. These resources make the information once available only to a few specialists much more easily viewed, discussed, and analyzed. The interested reader is referred to any of these widely available platforms for viewing satellite

imagery, which allow the exploration of earthwork patterns while moving easily between scales.

Typology

Earthworks in Mojos can be sorted into several discrete categories, some of which are well known, and also several transitional or distinctive forms, which invite further study.

The seasonality of flooding and drought is part of the annual cycle in Mojos. The same tree roots used to tie up a canoe in August are below the branches where fishing hooks are tangled in the treetops as wet season fishers catch palometa for dinner in January. During the wet season, forest islands often become actual islands, as even a meter of two of elevation places them above floods. All earthworks were built, maintained, and used in this seasonal context and must be considered from both the standpoint of flooding and drought. The highest points in Mojos are still affected by flooding and the lowest parts by drought. Because of local, regional, and systemic variation in the river system, flood waters vary considerably from year to year, throughout the use-life of earthworks and the lifetime of an inhabitant, a village, or a cultural tradition. It is difficult to overemphasize the importance of seasonality to all of the different types of earthworks.

Describing the earthworks by sorting them into types takes the emphasis off of geographic areas and places it on the actions of earthwork construction and use. No single type of earthworks is found throughout Mojos, and the larger, regional pattern is complicated. Many earthwork types, including ditched fields, mounds, ring ditches, causeways, and perhaps fish weirs, are all found on both sides of the Mamoré River. Although most raised fields are found west of the Mamoré, earthworks are ubiquitous.

Raised fields comprise a variety of distinctive types, varying considerably in form, context, distribution, and presumably in function and meaning. The largest categories of these earthworks are raised fields and can be considered in four types, called (1) raised fields, (2) large raised fields, (3) ditched fields, and (4) mound fields.

Raised fields Figure 2 are found most commonly in the southern half of Mojos, to the west of the Mamoré River. They may be the most widespread of the raised fields, although they are the smallest and therefore least visible on aerial photographs and satellite images. They take the form of earthen platforms with ditches directly associated on both sides, usually in strictly parallel blocks, and usually accompanied by causeways. They might be 5 m wide and 50 m long and form discrete blocks of about a hectare. These fields are accessed by the San Borja – San Ignacio road – and also have been found under old-growth forest to the south of this road. They clearly filled an agricultural function, and crops that were grown on raised fields include cocoyam (*Xanthosoma sagittifolium*), urucu (*Bixa orellana*), and yerba mate (*Ilex paraguariensis*) (Erickson 1995). It is likely that maize, manioc, and sweet potato were grown on raised fields as well, although there is as yet no direct evidence. Because of their association with long causeways and canals, raised fields could have benefited from the manipulation of water, especially to retain water longer into the dry season (Rodrigues et al. 2015, 2016). Raised fields of this type are also associated with a wide variety of mounds and earthen constructions, and in some cases, these other earthworks are found under the mature forest. These fields are spread across an area of about 20,000 km^2.

Large raised fields Figure 3 are found in the center and north of Mojos, to the west of the Mamoré River. In particular, the Iruyañez, Omi, Yacuma, and Rapulo rivers have about 40,000 large raised fields associated with them over an area of about 10,000 km^2 (Walker 2017). Large raised fields have a very different morphology from raised fields, being about 15–20 m wide, about 200 m long, and on the order of 40–50 cm difference between the top of the platform and the bottom of the adjacent canal or negative space. A more significant difference is perhaps that each platform seems to have a spatial independence from its neighbors: although fields are arranged close to one another, neighbors differ significantly in terms of orientation and size. Some fields are as large as 2 or 3 hectares and can be as long as 1,100 m. With a few exceptions at the edges of the

Earthworks of the Llanos de Mojos, Fig. 2 Oblique view of raised fields and causeways near San Ignacio de Mojos, Beni, Bolivia. Imagery from Google Earth and DigitalGlobe

geographic distribution, large raised fields are not found near either causeways, mound fields, or raised fields. They are sometimes found near forest islands, many of which contain habitation mounds and ring ditches. Direct botanical evidence for the cultivation of maize and sweet potato establishes that these fields had an agricultural purpose (Whitney et al. 2014). Improvements in satellite imagery have revealed about a tenfold increase in the number of visible fields since Denevan's 1966 counts (Walker 2004, 2017). Although many large fields are found on the high ground near to the Iruyañez and Omi, Yacuma, and Rapulo, this is not true for all large raised fields. They have been found in association with a sequence of inhabited forest islands over about 2000 years. Although they appear to have gone out of use sometime near the initial contact with Europeans (ca. 1500 C.E.), some could have been abandoned before or after this key moment.

Ditched fields Figure 4 are more difficult to circumscribe. Found to the north of large raised fields, they form a clear landscape pattern, distributed on both sides of the Mamoré River. Each of these small ditch networks cover about a hectare, with many small ditches dividing the area into spaces of several hundred square meters each. These areas of ditched fields are normally found directly adjacent to large forest islands, some of which (in the northeast) contain ring ditches and connecting canals (Lombardo and Prümers 2010). Similar ditched fields to the west of the Mamoré are only known from imagery but are spread across about 10,000 km^2.

Another type of ditched field or gridiron field (so named by Denevan (1966)) is also found in association with, and perhaps in some cases underneath, the raised fields of southwestern Mojos. These ditches are roughly parallel, sometimes form a perpendicular grid and can be spaced between 10 and 20 m apart. Although the general pattern of a ditch as opposed to a platform is present, these fields differ from the northern ditched fields because of the parallel and sometimes gridiron pattern. Many fields of this general type are found along the Apere River (Walker 2011b; Erickson and Walker 2009).

Earthworks of the Llanos de Mojos, Fig. 3 Oblique view of large raised fields along the Iruyañez River, Beni, Bolivia. Imagery from Google Earth and DigitalGlobe

Earthworks of the Llanos de Mojos, Fig. 4 Oblique view of ditched fields, east of the Mamoré River, Beni, Bolivia. Imagery from Google Earth and DigitalGlobe

Earthworks of the Llanos de Mojos, Fig. 5 Oblique view of mound fields, Beni, Bolivia. Imagery from Google Earth and DigitalGlobe

Mound fields Figure 5 are the subject of a set of archaeological and ecological studies in the western part of Mojos, near Santa Rosa del Yacuma. These fields are much smaller, consisting of circular mounds about 5 m across. They often appear in small blocks, with three or four rows of perhaps ten mounds. But in several places, (using DigitalGlobe imagery), continuous areas of mounds covering several square kilometers are visible, some of which seem to be situated as conglomerates of small blocks and others that seem to be lines of mounds outlining rectilinear areas, much like the areas outlined elsewhere by ditches. These mound fields, although previously mentioned, have not been well studied (Denevan 1966). Their spatial pattern is not unlike earthworks found elsewhere, in particular the raised fields of the coastal Guianas (Rostain 2008). This type of fields is spread over an area of at least 8,000 km^2.

In addition to the four categories of raised fields, which seem to have a clear if not exclusive agricultural function, at least six other types of earthworks have been classified to date: (1) causeways, (2) canals, (3) fish weirs, (4) ring ditches, (5) reservoirs or ponds, and (6) mounds.

Causeways Figure 6 are another earthwork type that spans both sides of the Mamoré River. Linear features might better be used as a broader covering term, to subsume causeways, canals, and fish weirs (which are also referred to as zigzag causeways). These earthworks are associated because of their similarity in form but because the act of construction makes causeways and canals mutually dependent. When building a causeway, the raw material taken from alongside necessarily creates a canal, on either one or both sides. Conversely, the excavation of a canal necessitates the disposal of the fill, which in many cases creates a causeway. The different forms can therefore be thought of as variations on the same kind of linear features, some of which reflect more clearly the construction of the causeway (or causeways) and others of which the excavation of the canal (or canals).

Causeways and **canals** are found more in the southern half of Mojos, both west of the Mamoré

Earthworks of the Llanos de Mojos, Fig. 6 Oblique view of causeways and fishweirs near Baures, Beni, Bolivia. Imagery from Google Earth and DigitalGlobe

in association with raised fields, forest islands, and inhabited mounds and also to the east of the Mamoré River, in association with the many large mounds in that region. Long straight causeways also characterize the Baures Hydraulic Complex to the northeast, where many linear features link large forest islands together. Many ring ditches are found within these large forest islands (Erickson 2010; Prümers et al. 2006), and in turn, the ring ditches are connected by both straight and curving linear ditches.

The marked seasonality of the Mojos forces a wide variety of interpretation on causeways and canals (Erickson and Walker 2009). Because water is retained on the heavy clay soils for so long after a rain or flood, any linear feature necessarily modifies the flow of water across the landscape. For this reason, modern construction includes massive drains, without which roadways would be cut after only a year or two. Pre-Columbian causeways and canals therefore had the potential to drain water away, to encourage it to flow, to impound it, or to mark it. It is probably the case that all of these functions were important in Mojos and more small-scale studies are certainly needed, of how the earthworks affected and were affected by flows of water.

Linear features could also have been used to facilitate travel and communication. In western Mojos, long causeways and sets of causeways link across more than 20 km in one example, and causeways more than 1 km in length are not rare (Denevan 1966). To the east of the Mamoré, causeways connect large mound sites to one another, making a stronger argument of the importance of transportation and communication.

To the west, in many cases forest has covered the causeways, and they are sometimes visible only as thick lines of trees, or as straight edges of large areas of forest. West of the Mamoré, raised fields seem to be directly associated with causeways. In most areas, raised field are found next to causeways, either perpendicular or parallel. In many locations west of the Mamoré, two, three, or four causeways are found in exact parallel, almost suggesting a transitional form between causeways and raised fields.

Many causeways are truly monumental. In addition to routinely surpassing 1 km in length, they are typically much taller and broader than raised fields, from 1–3 m higher than the surrounding pampa, sometimes 5–10 m across, and with a ditch that could add another 1 m of difference between the highest part on the causeway and the lowest part of the canal. In an open, savanna landscape, such a construction made the presence of the builders clear for generations.

Between the larger causeways of the Baures Hydraulic Complex lie the shorter zigzag causeways which Erickson interprets as **fish weirs**, an interpretation recently strengthened by comparison with current fishing traditions that use fish weirs in Zambia (Erickson 2000; McKey et al. 2016). Fish weirs have also been sighted on satellite imagery within the area marked by large raised fields, although they have not been surveyed on the ground. This adds another potential dimension to the spatial and chronological pattern of both fish weirs and large raised fields.

Ring ditches Figure 7 are among the more unusual earthworks in Mojos and have become best known through the aforementioned work of Erickson and Prümers (See also Carson et al. 2015). Ring ditches have also been found in west-central Mojos, and comparable constructions have been published from nearby regions: Acre and Rondonia in Brazil (Saunaluoma 2010), as well as in the Xingu, far to the east. By analogy with ethnohistorical records, a defensive function has been inferred, although there is no direct evidence yet of wooden palisades accompanying the ring ditches. As with causeways, the construction and maintenance of earthworks have an inevitable, hydrological consequence. In some cases ring ditches may have been used or modified to control or make use of water as it flowed into and out of the rivers.

Whatever other function ring ditches may have had, it is certainly the case that the intentional continuation of the ring ditch makes a clear spatial distinction between inside and outside the circle.

Earthworks of the Llanos de Mojos, Fig. 7 Oblique view of ditched fields and ring ditches near Baures, Beni, Bolivia. Imagery from Google Earth and DigitalGlobe

Ring ditch builders inscribed a place, distinguishing it from everything else on the landscape.

Some **reservoirs** or **ponds** could be considered a sort of transitional form of ring ditch. Along the large permanent wetland between the Omi and Yacuma Rivers, reservoirs a few meters across and a meter or two deep occur in circles around mounded, inhabited parts of forest islands (Walker 2008a, 2011a, 2017). Such reservoirs can hold water into July and presumably in some years can hold water year-round. Across the entire region, Denevan noted that many of the forest islands present throughout Mojos had a reservoir or pond immediately adjacent to them. These features await further exploration, especially in light of their potential as reservoirs for artifacts and paleoethnobotanical evidence.

The category of **mounds** encompasses a very wide range of variation, from the monumental mounds described by Denevan, Erickson, and Balée and excavated by Nordenskiöld and then Prümers, to the more modest but widespread mounds that are found throughout Mojos (Nordenskiöld 1913; Erickson 2006; Balée and Erickson 2006; Prümers 2015; Betancourt 2012). Mounds are landscape features that highlight the interpretive contradiction of a distinction between "nature" and "culture." For example, although 75% or more of visited forest islands in west-central Mojos are "artificial," in the sense that they contain ceramics, dark soils, and scorched clay (all indicators of human habitation), they are also "natural" in that they supported communities of plant and animals over the thousands of years that they were used and reused, built, and modified by generations of Mojeños. Of the 52 forest islands on mounds within west-central Mojos, 38 showed evidence of habitation, and it is not unreasonable to suggest that 75% of the other forest islands in that area will also show similar evidence of inhabitation. Forest islands suggest the need for a different categorization of the landscape and landscape features. For example, an island of forest located on the levee of a fossil river which rises about 2 m above the surrounding savanna and which is covered by about 2 m of dark soils with ceramics and burned clay throughout is both a natural and a cultural phenomenon.

East of the Mamoré, the mounds near Trinidad can cover several hectares and can range up to 18 m in height. Much more in line with earlier archaeological expectations, these mounds have drawn archaeological attention for 100 years. They show evidence of an elaborate funerary tradition centered on urn burial, sophisticated ceramic assemblages, and thanks to the work of Prümers and Jaimes-Betancourt, continuous occupation of at least 1,000 years (Mendoza book). Currently, mounds seem to be largely accretionary, in that the bulk of the volume of the mound fill is the result of long-term habitation, rather than a short-term construction event. The results from Loma Mendoza are not representative of all mounds in Mojos, but they do argue for long-term, continuous occupation.

Equally important are the connections between mounds and the landscapes they integrate, which are highlighted by Erickson and Balée's work at Ibibate/Eviato (Erickson 2006; Erickson and Balée 2006). This monumental mound, located inside of a forest, and invisible on satellite imagery and air photos, is associated with a forest vegetation that is clearly marked as artificial through an analysis of the species composition and distribution. This historical-ecological study makes plain that the forests of Mojos are fully as "cultured" as tag more obviously modified savannas. A compilation of recent research from across the Amazon Basin confirms the importance of anthropogenic forestry and concludes that "Domestication shapes Amazonian forests" (Levis et al. 2017: 931).

Finally, the presence of shell, carbon, and tools is suggestive of much older inhabitation of these locations that later became forest islands and mounds. There is a strong spatial momentum to the inhabitation of mounds and other earthworks. The shell mound phase of forest island habitation, which may extend back to 10,000 years ago, suggests that the domestication of the landscape is a long-term process (Lombardo et al. 2013b).

These categories of earthworks are analogous to the letters of the alphabet or the thematic elements in a picture or illustration, but the spatial arrangement of such elements adds another order of complexity to the language. The way that

communities of people created and used individual elements of the landscape varies with the spatial context of those elements. For example, a group of raised fields must be interpreted differently if it surrounds a forest island next to the river or if it stands in the savanna, far from the river, and any forest island.

Landscapes as Composites

Of this wide variety of different earthwork types, not all appear in all possible combinations. There are 11 combinations present out of a possible 127. Four out of 7 singles are represented, 7 out of a possible 21 pairs are represented, 1 out of 35 possible triples are represented, and no combinations of 4, 5, 6 or 7 elements for a total of 12 out of 127 combinations, or less than 10%. The most ubiquitous earthwork type is formed by causeways and canals (considered together) which are found in association with ring ditches, mound fields, raised fields, and fish weirs. Equally ubiquitous are ring ditches, which have been found in association with causeways/canals, fish weirs, large raised fields, and ditched fields. At the other end of the spectrum, the least connected types of earthworks are ditched fields, found only in association with ring ditches, and raised fields, which are found only in association with causeways and canals.

Setting aside the distribution of mounds, which may co-occur with all other earthwork types, only four types of earthworks appear in isolation: ditched fields, mound fields, large raised fields, and canals/causeways. One combination of earthwork types includes three elements: the ring ditches, causeways, and fish weirs of the Baures Hydraulic Complex. There are additionally six other combinations of two kinds of earthworks, all of which beg further investigation, and several of which are known only from remote sensing. As imagery improves, it is possible that other combinations of elements will emerge.

Of these composites, the pairing of raised fields and causeways is perhaps the best known, covering more than 10,000 km^2, centered on San Ignacio de Moxos. Raised fields of this type (which here includes both the tall 5 m by 50 m by 1 m fields as well as shallower gridiron fields) seem to appear only with causeways nearby and usually directly associated.

The combination of mound fields and linear features can be seen in several locations and seems to be characteristic of the center of the overall distribution of mound fields. This composite pattern is known only from satellite imagery.

The conjunctions of large raised fields with each of mound fields (to the west) and ditched fields (to the north) are a function of the "frontier" or boundary zone between the large spatial distribution of each of these three distinct categories of agricultural fields. These zones of contact are not at all larger but could be indicative of chronological relationships.

The relationships between large raised fields and ring ditches are clear in the southern part of the distribution of large raised fields, but not in the northern half. These ring ditches seem to be significantly older than those found to the east of the Mamoré River (Walker 2008; Erickson 2010; Prümers et al. 2006).

The combination of between large raised fields and fish weirs has not been verified on the ground, although the visual evidence is clear. The putative fish weirs west of the Mamoré are laid out between areas of high ground covered with raised fields, rather than the forest islands of the Baures Hydraulic Complex.

Finally, the combination of ring ditches and ditched fields likewise awaits archaeological fieldwork, although the visual evidence is clear. Some investigations have already been made for ditched fields in this area, although not in direct association with ring ditches.

Current Debates

Agriculture and Population

A wide variety of different types of agricultural earthworks spread across tens of thousands of square kilometers raises questions about the relationship between agriculture and population. The question might be thought about both as a matter of how many people could a landscape of raised fields support and also how many people such a landscape required in order to be sustained.

An earlier study (Walker 2004) of a study area in one of the more densely packed areas of large raised fields in Mojos, near the confluence of the Iruyañez and Omi Rivers, it was argued that the population was on the order of 100 times greater than the population living in that area in 1996–1997. This estimate was based on the number and size of raised fields present in the area and also the number of forest islands with evidence of pre-Columbian habitation. Continued test excavation in forest islands along the Yacuma and Rapulo Rivers suggests that the pattern of inhabited forest islands continues throughout the area characterized by large raised fields. Although not all areas of Mojos have the same density of earthworks, the archaeological evidence in west-central Mojos, throughout the lower Iruyañez Omi, Yacuma, and Rapulo Rivers, is compatible with dense populations.

The enduring difficulty with interpreting archaeological landscapes is the problem of chronology. Dating earthworks conclusively requires excavation and analysis, and with more than 40,000 large raised fields in west-central Mojos (as only one example), it is not feasible to date all of them. On the other hand, it is clear that the current landscape of earthworks has endured for at least several centuries, since abandonment. Paleoethnobotanical evidence suggests that raised fields came into use no later than AD 300 in west-central Mojos. Rather than showing a snapshot of agriculture at any single point in the past, extant spatial patterns are instead a palimpsest indicative of the agricultural landscape at the time of abandonment. The connections between raised fields and associated population are complicated by the impossibility of knowing if all the fields were in use at any one time. Spatial analysis helps to supplement direct dating of earthworks.

If west-central Mojos was home to something on the order of 100,000 people, similar ranges of variation might obtain for the other combinations of earthworks in Mojos. An overall estimate for the entire region might range above 200,000 but perhaps not as high as 1,000,000 people at any one time. It is unwise to specify a more exact estimate, based on currently available archaeological evidence. The combination of earthwork mapping with forest island excavation and testing suggests that such a range is reasonable. It is not clear that the Mojos farmers were near to any kind of a carrying capacity, since many areas suitable for raised field construction do not appear to have been used for that purpose. A large, seasonally mobile population, perhaps with great mobility over longer periods of time, presents an interesting set of implications for the region and for neighboring regions.

If Mojos included several successful agricultural economies, perhaps in association with related hunting and fishing practices, connected not only through overland but riverine routes, Mojos communities may have had a significant effect on neighboring highland communities, as well as other Amazonian regions. At a regional scale, Mojos could have served as a refuge for populations from neighboring regions, similar to the relationship between the highlands of Southeast Asia in relationship to neighboring states in lowland valleys (Scott 2009). Little direct archaeological and ethnohistorical information is available, but the relationship between the Inca and cultures in the Amazonian lowlands suggests that although the Inca were interested in contact with Mojos, they did not extend control over the region.

A more positive statement is that the evidence from the archaeological landscape establishes that productive and varied agricultural practices were developed and sustained over a time span of centuries, perhaps millennia. Although Mojos earthwork builders undoubtedly moved between different fields and forest islands throughout the year, and across the decades, Mojos was not an isolated zone but a place that supported a variety of people, plants, and animals, gathered into communities and practicing traditions that were created and expressed through diverse material, botanical, and linguistic practices.

Paleoethnobotany and Domestication

If our understanding of the composition of Mojos as a landscape or a set of landscapes is improved through analysis of remote sensing data, then the best prospects for future work require the integration of paleoethnobotanical data, to understand

the palette of plants that gave color to these sketches. Pollen cores, phytolith analyses, and the recovery of starch grains have given us valuable clues from several locations, but we have yet to assemble these clues into more comprehensive histories of earthworks, either in isolation at the minimal level, or in combination at larger spatial scales.

The combination of cutting edge paleoethnobotanical research and landscape archaeology is beginning to blossom, and the prospects for continued integration are very bright. Paleoethnobotanists use pollen, phytoliths, and starch grains, in addition to macro remains such as gourd fragments or corn cobs, to characterize and analyze plant communities that grew in different contexts (Brugger et al. 2016; Bruno 2010; Bush et al. 1989; Dickau et al. 2012, 2016; Iriarte et al. 2012; Rodrigues et al. 2015; Watling et al. 2015; Whitney et al. 2013, 2014). To date, this has established connections between raised fields and inhabited forest islands, mounds, and ring ditches and outlined the suite of plants that may have been cultivated in several cases. Because paleoethnobotanists have good reason to believe that several plants, including manioc (*Manihot esculenta*) and peanut (*Arachis* sp.), may have been domesticated in the Southwest Amazon (Clement et al. 2016; Isendahl 2011; Oliver 2008; Piperno and Pearsall 1998), the continued integration of paleoethnobotany into archaeological research will help establish the chronology of agriculture in Mojos, including the potential role of maize-based and bitter-manioc-based agriculture (neither of which seem central to local cuisine or ethnohistory), which are important in many other regions of South and Central America. In comparison to other examples of long agricultural sequences in the Americas and around the world, Mojos contains (1) clear evidence of domesticated landscapes (at least in later times) and (2) long-term use of maize and potentially manioc.

The conjunction of the southwestern Amazon as a potential locus of plant domestication, and Mojos as a set of agricultural landscapes, raises the question of how the domestication of plants articulated with the domestication of the landscape.

Evidence from pollen cores as well as phytoliths and starch grains suggest that Mojeño peoples were cultivating a wide variety of crops and taking advantage of an even wider spectrum of plants. Maize (*Zea mays*), an important food crop whose microbotanical remains have been well studied, appears in Mojos in recent paleobotanical studies (Whitney et al. 2014; Dickau et al. 2012). Maize phytoliths have also been recovered from raised field contexts, so it seems clear that maize was part of raised field farming. From pollen cores nearby, evidence of sweet potato and the tree crop ice cream bean (*Inga* sp.) suggest a wide range of consumed plants. Microbotanical remains from other locations to the south and east suggest a range of crops, including manioc. An early study of botanical remains showed the presence of huallusa (*Xanthosoma sagittifolium*), guayusa (*Ilex paraguariensis*), and urucu (*Bixa orellana*), a root crop, a stimulant, and a colorant or condiment (Erickson 1995). The overall picture is one of diversity in domesticated and cultivated plants. Further research is necessary, but it seems likely that the diversity of earthwork types is matched by a diversity of useful plants and perhaps a comparable diversity of cuisines based on those plants.

Different plants have different requirements from the soil, and raised fields (originally defined as constructions that improve the quality of soil for agricultural purposes) had different effects on soil that could have been useful in different ways. Manioc, an exceptional source of carbohydrates and a staple food for hundreds of millions today, requires good drainage but can grow in poor soils. In order for manioc to be continually harvested, the plants need to protected from flooding, which rots the tubers. Many raised fields clearly work to improve drainage, which would make them suitable for manioc. Maize, another staple, has stricter requirements for soil nutrients. The crop must be harvested all at once, but agricultural fields do not have to remain in use for the entire year. Other plants of course have their own drainage and nutritional requirements, as well as annual or perennial life cycles. Denevan posited that maize was probably not important in savanna cultivation, because of the quality of the soil, but recent

paleoethnobotanical evidence establishes that maize was present. Differences at a smaller scale could be decisive, however, for example, if fields are near or far from the river, or near or far from forest islands, where presumably food processing and cooking took place and houses were inhabited. It is likely that raised fields were home to many different plants over their use-lives.

Another category of plant use in Mojos is the industrial use of plants, for many purposes, including house construction, spinning and weaving, tools, canoes, and basketry. Although baskets have not been recovered in excavation and are unlikely to preserve, their impressions are often found on ceramics, confirming the presence of a strong basketry tradition in the past. An example from the ethnohistoric literature also confirms the importance of plants for Mojos toolmaking: the "Cayuvava" basket is a hand-carried woven fish trap that used both slats of palm wood and basketry for joining. The Mojo and Baure were famous to the Jesuit missionaries as weavers of cotton cloth, and wore large cotton tunics or *tipoy*, which suggests the importance of weaving, as does the ubiquity of spindle whorls in some parts of Mojos (along the Apere River, for example; see also Betancourt 2012).

It is possible that different types of earthworks were associated with different sets of crops or with different plants at different times in the flood cycle. Connections across Mojos by land and water suggest that these differences might have contributed to the exchange of plants, both harvested products but also seeds and cuttings, this could have made Mojos a test garden for the modification and domestication of a wide range of plants, not only those that might have first been domesticated in the Southwest Amazon but also a range of others from around the Americas.

Language and Ethnicity

The association of specific spatial patterns with cultural and linguistic groups like the Mojo, Baure, Movima, Cayuvava, Itonama, and Canichana is intriguing, particularly as linguistic evidence suggests a long tenure for the contact between these language groups as part of the Guaporé/Mamoré linguistic area. There can be no doubt that the ancestors of these contemporary communities build the pre-Columbian earthworks. But the historical complexity of 300 years of post-colonial history, on top of perhaps 200 years of post-Columbian history, without any written records, makes direct associations problematic at this time.

The Amazon in general encompasses a high level of linguistic diversity, with several "hot spots" or areas where this diversity is as high as anywhere in the world. In the Xingu, the Vaupes and the Guaporé/Mamoré region, anthropological linguists have identified communities of speakers of diverse languages. These situations of language contact and interaction appear to have been relatively stable over many hundreds or thousands of years. Some linguistic research suggests that these areas of linguistic diversity have a character distinctive to Amazonia. In the Vaupes, and to an extent in Mojos as well, it is possible to characterize the long-term relations between languages found within the same area (Crevels and Van der Voort 2008; Michael and Epps 2016). The Guaporé/Mamoré linguistic area, of which Mojos forms about half, contains more than 50 distinct languages, from 8 stocks, with 11 isolates. Isolates are languages which after linguistic study cannot be classified with other languages into a taxonomic relationship.

Mojo and Baure are the two Mojos language classified with the Arawak language family. Much of the ethnohistoric literature focuses on the speakers of these languages, in particular the account of Eder, from whom we have the best ethnohistoric descriptions, which focus on the Baure, from the early 1700s (Eder 1985). These Arawak speakers were of interest to the Jesuits because of their practice of wearing cotton tunics and eventually becoming more acclimated to life in the Missions. Van Valen (2013) documents some of the conflicts in the early colonial period, including a rebellion by the Cayuvava, in which the mission records for that group were entirely destroyed. The ethnohistoric record has obviously been shaped by history. Even as we take advantage of the available descriptions, the bias of the sources toward the Arawak-speaking Mojo and Baure should not obscure the importance of other groups in pre-Columbian Mojos.

In the Guaporé/Mamoré region, languages show signs of having been in contact for at least several centuries, not through shared vocabulary, but because they share distinctive grammar structures (Michael and Epps 2016). Although people might have heard or spoken several languages, they did not use words from one language while speaking another. "Spanglish," to use a common expression for this kind of linguistic mixing, would not have been approved of in pre-Columbian Mojos. Perhaps this set of relationships between languages and speakers of languages was associated not only with many languages existing within a small space but also with individual speakers using several languages. From other Amazonian examples, it seems that multilingual settlements, even at a small scale, are not only viable but sustainable.

Although the spatial patterns of different kind of earthworks are distinct, in an analogous way to the clear distinctions made between Mojo, Baure, Movima, Cayuvava, Itonama, and Canichana in the nineteenth and twentieth century, at this time it is not clear that any language can be connected to a kind of earthworks. Two avenues of research should address this question. First, continued investigation of the paleoethnobotany and experimental archaeology of each of the different kinds of earthworks. Causeways and ditched fields, for example, cut across the traditional territories of modern indigenous groups, but it may be possible to connect those earthworks to particular kinds of agriculture, particular plants, or other distinctive practices. Focusing more on particular traits, like the Cayuvava *covó* or fishing basket, differences between *chicha moreno* and *chicha de maní*, or different ways of preparing manioc (*chivé* in Santa Ana or *aruchipava* in Exaltación), could help establish more connections between the archaeological record and the historical record. There is no reason to assume that these connections cannot one day be established.

Another starting point is to examine the archaeological record for correlates for the kind of cosmopolitan, multilingual mix of cultural traditions suggested by the combination of the record of landscape diversity, and the pattern of linguistic diversity. Because groups of people were capable of moving across the landscape, they could have alternated between seasons of concentration along the rivers, taking advantage of the ability to bring together people, but also food and drink, and seasons of dispersal, perhaps up the rivers and wetlands farther from the main tributaries, onto smaller forest islands or into the larger forests. The period of time during which such a multilingual ecumene was present is perhaps difficult to date, but correlations with other kinds of diversity would be revealing. Such studies would necessarily include comparisons with areas outside Mojos.

Mojos in Amazonia

Fieldwork and scholarship in other parts of the Americas show that Mojos is not unique in having widespread evidence of anthropogenic landscapes (Erickson 2008). Mojos may seem a unique expression of a sort of hybrid identity, part Andean and part Amazonian, combined in a unique and nonrepresentative savanna environment, but pre-Columbian communities across the Americas used fire, earth, and water to build and maintain landscapes over thousands of years. Their ideas about their relationships with plants and animals were part of decisions they made to improve the soil for farming and gather together certain kinds of plants and animals (and fish). Mojo is distinctive because earthworks are more visible there. Throughout the Americas and the world, indigenous communities created the landscape by inhabiting it. Not just modifying it on some technical criteria but also by expressing or evading their own meanings.

Mojos is both archaeologically distinct and part of a larger Amazonian world. On the other hand, it has been and remains in contact with Andean peoples to the south and west, with the Altiplano only a few hundred kilometers away. Rather than analyze Mojos as either an exception to or the epitome of a theoretical expectation for the Amazon, it is better seen as the product of a unique history that combines natural and cultural categories.

Mojo has been presented as a unique region, one that, because of raised fields and other earthworks, is exceptional and not representative of Amazonian landscapes in general. An example

of this interpretation of Mojos' exceptionalism are (McMichael et al. 2017; Levis et al. 2017) in which Mojos is scored as an entirely anthropogenic landscape in a continental model for pre-Columbian land use. The model uses archaeological "sites" as points with a value of 1, and an area in Mojos covering more than 100,000 km^2 is also designated as a 1 within the geospatial modeling. In sum, Mojos is taken to be different from all other areas in the Amazon, because of its unique, human-created landscape. In other examples, Mojos is defined out of the Amazon, as an area that is more closely related to the Andes, because the ethnographically and archaeological known cultures are sufficiently different from other Amazonian cases so as to warrant an entirely different designation.

Another reason that Mojos is sometimes excluded from consideration as part of Amazonia is that it lies upstream of the Madeira-Mamoré rapids, which prevent navigation by large river boats, and, in the nineteenth century, were a significant barrier for upstream travel into the region. These rapids do have an effect on river travel, as well as the biogeography of fish, for example. But the rapids can be and were traveled in the nineteenth century, and the presence of a wide variety of language groups upstream of the rapids indicates that travel into and out of Mojos from adjacent areas did in fact occur in the pre-Columbian past.

This characterization of Mojos as unique is less useful for three reasons. First, the region is unequivocally part of the Amazon basin in a hydrological, climatic, and geographic sense. Second, it is demonstrably false that Mojos was continuously covered with inhabited space, at least in the way suggested by outlining it as a single "site." A more nuanced approach than the splitting of space between nature and culture is required. Third and most important, the archaeological record demonstrates significant continuities between Mojos and nearby regions, as well as other locations with Amazonia more generally.

Geoglyphs found in the nearby departments of Acre and Rondônia in Brazil show that similar earthwork building activities were spread across the southwestern Amazon, from Acre to Amazonas department (Pärssinen et al. 2009). Further to the east, circular earthworks and possibly managed forests have also been documented in the Xingu (Heckenberger 2008). In the initial rush of documentation of raised fields in the neotropics, Ecuador, Colombia, Venezuela, the Guianas, and highland Peru and Bolivia were all noted as parallel cases, in South America. Since that time, more fields have been found, and existing areas have been understood to be larger and more densely farmed. It is certainly the case that Mojos is a uniquely complicated and large-scale example of landscape engineering, but this may have more to do with the visibility of fields in the savanna. Similar landscapes have been found and continue to be documented across the Americas.

The archaeological landscapes of Mojos are clearly a unique combination of earthwork types, assembled into different patterns over many centuries. The ethnohistoric record shows that Mojos is a distinctive area with a very high diversity of language groups. The material culture record shows that a wide variety of material cultures are present across the region. Mojos is a diverse and distinctive place, but it is not unconnected to regions that surround it, in particular the neighboring Amazonian regions.

Blueprints for the Future

The restoration, rehabilitation, or reactivation of pre-Columbian agricultural technology is a goal that has interested inhabitants and scholars for many years. Although the political, environmental, and economic challenges facing such an effort are serious, tremendous potential for economic development remains. The potential is great for a fruitful connection between the ecological, archaeological, and agronomic study of agricultural techniques and the economic development of eastern Bolivia (Lombardo et al. 2011, 2012; Renard 2012a, b; McKey et al. 2010).

One of the greatest attractions of raised field agriculture as a development alternative is the low-technology methods which the farmers originally used to create and maintain the raised fields. Agricultural strategies which are less land intensive, but with higher inputs, are currently coming

into play in eastern Bolivia and Amazonia more generally. Cattle ranching has the longest post-Columbian tenure and takes advantage of a very large area with minimal labor. During the Jesuit period, a sizable herd of feral cattle represented the main human impact on the savanna, a herd that was used both by the mission residents, and most likely by groups outside the mission system. Cattle ranching continues today as the main agricultural strategy in Mojos. The form of agriculture which seems most likely to replace ranching is soy farming, which dominates in Santa Cruz province to the south. The techniques used by soy farmers, working for a global market, include tractors, seed varieties, and all the other correlates of mechanized, global agriculture.

Raised field agriculture clearly stands in a different trajectory from either of these two alternatives, but the most important difference may not be the distinct and more expensive inputs. A more significant pair of differences is probably that agricultural systems based on earthworks probably took place with more locally dense populations and certainly with different concepts of relating people and land. Because pre-Columbian societies operated without money, their economic systems, which presumably surrounded, created, and depended on raised field agriculture, were different from the current economy, within which any restored raised field agriculture would have to thrive.

Efforts to study raised fields with an eye to rebuilding and reusing them are underway. Local agronomic and ecological studies continue to document and analyze the processes that create and affect raised field soils, plant, and animal communities. Several locations around Mojos have seen the creation of experimental raised fields, including the Biological Research Station of the Beni, near Totaizal; Comunidad Bermeo, along the San Borja-Trinidad road; the Museo Etnoarqueologico "Kenneth Lee" in Trinidad; and the Comunidad San Lorenzo near Santa Ana del Yacuma. In each case, raised fields were built on a modern plan derived from pre-Columbian models. Field dimensions, crops, and fertilizers have been tested and compared. However, an important variable that has yet to be fully recognized is to consider the original placement of pre-Columbian raised fields.

If pre-Columbian raised fields were renovated and recreated in place, it would tackle the question of whether and how the original raised field farmers solved their own agricultural problems and how the original field locations and dimensions were part of these solutions. Field height on a particular landscape can be recovered through careful excavation, even if it is not archaeological excavation, and at least in some places, a doubling of topsoil can be easily created. The locations of archaeological raised fields are now easy to pinpoint using satellite imagery that has been published into the public domain, and with internet access increasing throughout the Amazon, the technical resources are in place to assist interested parties in renovating earthworks.

Political and economic challenges are much more significant than the technical ones. Most raised fields are on private land, and indigenous communities in Mojos do not usually have access to the large areas of open savanna where many raised fields are found. The cases mentioned above have found creative solutions. To build and maintain fields, a way reminiscent of how they were used in the past requires more labor per hectare than is usually available in the countryside. If many ranches cover about 10–50 km^2, and they are usually inhabited by 1–10 cowboys, and perhaps 50–500 cattle, this might correspond to the same 10–50 km^2, which about 0.1–5 km^2 of raised fields, and 100–1000 people, with no cattle, and many more deer, capybara, agouti, and other animals.

It is unlikely that Bolivians will adopt a pre-Columbian lifestyle in the early twenty-first century, so for raised field agriculture to become a part of development, a different set of relationships between landscape and society will have to emerge. This will call for communication between different stakeholders and creative ways to make raised field agriculture profitable. Although the forms of those solutions are not clear, one idea might be a link between pre-Columbian agriculture and the creation of a regional cuisine. Links between cuisine, agriculture, archaeology, and ecology could function through the strengthening of tourism in Mojos.

Cross-References

- ▶ Agricultural and Social Earthworks in the Guianas
- ▶ Earthworks of the Amazon
- ▶ Geometric Earthworks of Western Amazonia

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East Africa: Historical Archaeology

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Introduction

For almost four decades, Africanist archaeologists have expressed dissatisfaction with the more dominant definitions of historical archaeology – as either the study of time periods and events for which written sources are available and of societies that have developed a literate tradition (e.g., Deetz 1977) or the era of European expansion and exploration from the fifteenth century onwards (e.g., Hall 1993) or even of the emergence of the modern world (e.g., Orser 1996). Their primary objection to these alternative definitions, most of which originally developed in North America, has been that from the perspective of the African continent, these offer only a partial indication of the potential scope of "historical archaeology," given the existence of a rich legacy of diverse oral sources and the activities of a range of non-European yet external actors at different times both prior to and after CE 1500. Aside from the often Eurocentric bias of several of the more prominent definitions of historical archaeology, concern has also been expressed over the legitimacy and need for the distinction between

"historical" and "prehistoric" archaeology, with some scholars arguing for complete abandonment of these terms and the division of intellectual labor they promote. One consequence of this dissatisfaction is that it has generated a rather diverse range of approaches to and definitions of historical archaeology in different parts of the continent and among different scholars, underlining Hall and Silliman's observation that "historical archaeology means different things to different people" (2006: 1). This entry reviews some of these issues and illustrates the changes in approach and theoretical frameworks that have shaped historical archaeology in eastern Africa since the 1950s.

Historical Background

Initially, the practice of historical archaeology in East Africa, as was the case for most parts of the continent, followed the textual model. Publication by Freeman-Grenville (1962) of documents dating from the first to early nineteenth century CE concerning the east coast of Africa made these sources more accessible to archaeologists. However, it is the work of James Kirkman (1959) and Neville Chittick (1974) on East African coastal sites that is more usually considered as representative of the first examples of historical archaeological study in the region. Kirkman, in particular, was one of the first scholars working in the region to explicitly define his investigation of coastal Islamic sites such as Gedi and Ungwana in Kenya, as "historical archaeology," largely because these initial investigations were guided by existing Classical and early Islamic textual sources. The former include the first- to second-century CE Greco-Roman texts, the *Periplus of the Erythrean Sea* (∼CE 100) and Ptolemy's *Geography* (∼CE 150), while the latter comprise diverse geographies such as Al-Ma'sudi's reports in the tenth century and that by Ibn Battuta, based on his travels on the continent during the fourteenth century. The various Swahili Chronicles are another much used set of historical texts. These are locally written documents that record the history of Swahili towns from their foundation to the beginning of the Portuguese period but which were penned much later. There are also a number of relevant Chinese textual accounts from the early second millennium CE, some of which may be based on firsthand observations and are currently guiding efforts to locate possible shipwrecks off the north Kenya coast.

Like many of the first generation of historical archaeologists in North America, Kirkman and Chittick paid more attention to the most visible monumental ruins such as forts and large stone-built towns, rather than on the less obvious archaeological remains, thereby prioritizing the sites that they assumed were associated with "outsiders." In doing so, Kirkman (1959), for example, associated all of the Swahili stone towns as having been founded by Arab "invaders" that he believed once settled along the coast of East Africa. Likewise, Chittick's excavations at Kilwa and Manda relied heavily on the Swahili Chronicles to inform his research. Like Kirkman, Chittick (1974) tended to associate the origins of Swahili coastal stone towns with Arab immigrants, who likely began arriving from the eighth to ninth century.

This tendency to focus more on visible monuments rather than on less obvious archaeological remains, as well as overreliance on written texts, not only excluded indigenous Africans from their own history but also distorted the historical facts. Since the mid-1980s, however, archaeologists working on these Swahili period sites have typically downplayed the "foreign" element to their formation, emphasizing instead local dynamics and contributions. More recently, several research projects undertaken by African archaeologists (e.g., Chami 1999) at Kilwa Kisiwani and other coastal sites including Mafia, Kwale, and Koma and in the Rufiji Delta have overturned most of the original models proposed by Chittick and Kirkman. In particular, these later studies have revealed that at many of these sites there is evidence of pre-Islamic settlements dating as far back as the Stone Age periods. These findings thus contrast with those of scholars who asserted on the basis of written records and a specific focus on the visible archaeological remains that the ninth century was the date for the beginning of settlements along the East African coast, these being established by Arab-Persian immigrants.

As the subdiscipline of historical archaeology has continued to grow and expand geographically, scholars working in sub-Saharan Africa (e.g., Reid and Lane 2004; Schmidt 2006) have criticized the narrow focus on "the spread of European culture, practices and peoples to other parts of the world" that characterized the historical archaeology in its earlier, largely North American phase. Schmidt (2006: 4), in particular, has argued forcefully that such an understanding needs "repair" because its Eurocentric focus excludes other research areas of significant interest to non-European communities. Methodologically, earlier definitions of historical archaeology have also been criticized for considering the presence of written records as central to the practice of historical archaeology, a perception that implies an absence of any historical processes and events in the non-Western/nonliterate world prior to the advent of a literary tradition. Reid and Lane (2004: 7) argue that this approach obscures the study of extended periods of the past in areas where literacy appeared relatively late, as was typically the case for much of sub-Saharan Africa and many other parts of the world. Schmidt (2006), meanwhile, has highlighted the potential offered by oral sources to access much "deeper" time periods well before a European presence and which are more conventionally understood to be the realm of prehistorians.

Additionally, the earlier definitions of historical archaeology failed to recognize the existence of "other" non-Western written texts that were produced well before the era of European expansion (Reid and Lane 2004). In Africa, for example, these include ancient Egyptian, Arabic, Chinese, and Amharic texts, all of which recorded the history of indigenous Africans, and in some cases these texts predate the advent of Western literacy. Finally, the temporal range of more dominant definitions is another major problem. Specifically, the onset of European expansion into other parts of the world (from 1498 – when Christopher Columbus first sailed to the Americas) has often been regarded as the date for the beginning of historical archaeology. This seems to imply that there cannot be anything termed as "historical archaeology" prior to the late fifteenth century. Contrary to this idea, however, there have been several studies termed as historical archaeology, particularly along the coast of East Africa, that have extended beyond this temporal boundary, due to their use of both textual and material sources. In short, the older definitions of historical archaeology seem to imply that non-European communities only began making their histories with the arrival of Western writing traditions, something that is manifestly untrue.

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Key Issues

Definitions and Methods

Responding to calls to refine earlier definitions and perceptions of historical archaeology, Africanist archaeologists (e.g., Reid and Lane 2004; Pikirayi 2006; Schmidt 2006) have found it more helpful to define their field on the basis of methods used rather than the period and subject of study. Pikirayi (1993: 36), for example, has proposed that historical archaeology in Africa is essentially "the study of sites which can be interpreted with the aid of historical sources such as written documents, oral traditions and historically datable artefacts." His approach is thus one in which the material record is used to test written or oral records to reveal changes within communities who have not necessarily been represented in recorded history. Pikirayi goes on to identify two categories of historical sources that can be integrated in historical archaeology studies, namely, "external" and "internal" sources (2006: 230–232). The former are those produced by "outsiders as direct observers, transcribers (for the case of Africa), and copiers of verbal accounts provided by various visitors to foreign lands" (Pikirayi 2006: 230). Thus, the published firsthand accounts by Europeans in Africa since c. 1500 CE onwards fall within what Pikirayi calls "external sources," as would late first millennium CE and early second millennium accounts compiled by Arab geographers and the early first millennium Classical texts such as the *Periplus*.

On the other hand, internal sources include a range of broadly historical accounts produced by

different African societies, such as "oral tradition and histories, myths and personal anecdotes transcribed by professional historians and anthropologists" (Pikirayi 2006: 232). Regardless of which definition is preferred, there is general consensus among Africanist archaeologists that historical archaeology should seek to integrate and interrogate archaeological types of sources such as artifactual, ecofactual, structural, and architectural remains and their contextual, spatial, and temporal associations and characteristics, with other non-archaeological sources that can broadly be defined as "historical."

Escaping Ethnocentrism: Alternatives in Non-Western Settings

The realization of the potential of non-written sources in historical scholarship began in the 1960s, notably through the use of oral traditions to document the histories of those Africans (who constituted the majority of the continent's population) whose histories had never been textually documented. Oral information has been utilized in many ways by archaeologists working in the region, including, for example, for locating and interpreting archaeological sites and materials, in aiding an understanding of potting techniques and functional categories, and in explaining the techniques and symbolism associated with iron production. More generally, archaeologists working in east Africa and elsewhere on the continent began to integrate non-written sources into their works in a range of contexts as part of a broader goal aimed at rewriting the histories of African people.

Initially, much of this work aimed at either verifying or "fleshing out" the oral sources. During the 1950s–1960s, for instance, various archaeological campaigns were undertaken to locate archaeological sites in Uganda, such as Bigo, Munsa, Kibengo, and Kasonko, mentioned in the oral traditions concerning an elite known as the Bacwezi, so as to get a better idea of their function and date of construction. This lead to the proposal by Posnansky (1969) that Bigo was the capital of the pastoral Bacwezi kingdom and that the other sites were part of the same political system. More recent field investigations by Robertshaw (1999) at Munsa and Kibengo, however, suggest that rather than there having been a single mega-state, there were a number of smaller polities each administered from a capital encircled by a complex of ditched earthworks.

Schmidt (1978) also drew on the oral sources concerning the Bacwezi to develop an alternative, structural approach to the study of the region's historical traditions and to extend their application to consideration of a deeper time depth. In particular, he brought together archaeological methods and oral traditions to explain the development and flux of African Iron Age culture from its earliest beginnings (around 500 BCE) in the Buhaya region of Tanzania to contemporary times. Through oral traditions, Schmidt explored several aspects of Haya culture, ranging from the economic systems of iron working and agriculture, to mythology and local spirit mediums, in order to inform his archaeological interpretations. Interestingly, Schmidt found that the Bahaya's conceptualizations of the past clearly related to the patterns and distribution of material remains left by Iron Age peoples some 2500–2000 years ago. A similar study by Mapunda (1995) is another excellent case demonstrating the value of oral tradition and ethnography in archaeological research. In his research on iron-smelting practices and symbolism in the southern highlands along the shore of Lake Tanganyika in Tanzania, Mapunda engaged with the oral tradition and histories of people in the region to identify and locate iron-smelting sites, where he found the remains of bowl furnaces (*Katukutu*) that are, in most cases, invisible on the ground surface.

More recently, the incorporation of non-written sources such as oral traditions and ethnographic information in archaeological studies has gone even further by helping to challenge elements of "received wisdom" concerning the causes of contemporary problems, much of which originated from the "colonial library." One case to demonstrate this concerns the alleged impacts of pre-colonial African subsistence strategies on the environment. A study by Lane and his colleagues on soil erosion in the Haubi Basin, north central Tanzania, for example, aimed at delineating the link between soil erosion, iron smelting, and human settlement in the area (e.g., Mapunda 2003; Lane 2009) from the perspective of historical

ecology. Colonial and postcolonial narratives had pointed to local iron-smelting practices in the region as the main cause of soil erosion, assuming that this practice involved the mass harvesting of fuel wood that led to deforestation. Contrary to this idea, oral traditions and ethnographic data collected by Mapunda, coupled with the results of archaeological survey and excavation (Lane 2009) and metallurgical analysis of iron-smelting remains (Mapunda 2003), revealed that the smelting technology practiced in the area was fuel efficient and was unlikely to be the primary cause of deforestation since smelters used only three to four tree species of hardwoods for charcoal and these made up only a fraction of local forests that existed prior to soil erosion (cf. Schmidt 1997).

A more recent historical archaeology study by Bignagwa (2012) examined aspects of the animal economies practiced by local communities inhabiting the Lower Pangani River Basin in Tanzania, to discern whether any changes to these economies could be plausibly linked to the expansion of the caravan trade in the nineteenth century. The study aimed at recovering archaeological evidence from a sample of settlements known to have been involved in the nineteenth-century caravan trade. Analysis of the faunal remains sought to determine whether herd management strategies and culling practices had been modified so as to generate a surplus supply of meat that could be sold to the passing caravans. The study relied on multiple sources of information, including written and cartographic nineteenth-century European sources, oral traditions and histories, and archaeological data encompassing artifactual, structural, stratigraphic, and faunal remains, in order to address those objectives. The existing archaeological records and written and oral historical accounts were used to help locate settlements that had *direct* contact with trading caravans, while oral information and ethnographic studies were used to help explain some of the patterning in the zooarchaeological record – such as the high presence of rodents in the faunal assemblages – and also to help identify different fishing practices. Artifactual evidence recovered from these settlements was cross-referenced and analyzed, and as with the faunal remains, oral traditions were used to aid interpretation of cultural materials and to help understand local practices surrounding those materials.

By cross-referencing oral historical and archaeological data, it became clear, for example, that many of the primary and secondary written sources either underestimated or overestimated (and in some cases overlooked completely) important aspects of the trade and social lives of the community under study. For example, hunting is not given much attention in the historical texts, yet the zooarchaeological data obtained by this study indicates that hunting of wild animal species formed an important aspect of the subsistence strategies of nineteenth-century Zigua communities in the Lower Pangani. Additionally, while the dominance of smaller mammals such as rodents and elephant shrews in the faunal assemblage could be misinterpreted (based on the Prey Choice Model derived from Foraging Theory) as an indicator of subsistence stress, the Zigua oral traditions consistently claimed that inclusion of smaller mammals in the diet was due to their palatability, and not because of shortages of meat supply. Another example concerns the misperception of the Zigua island settlements. These have long been regarded in the primary historical sources as having originated in the nineteenth century as refuges, built in response to the increasing threat of cattle raiding by neighboring pastoralists, which is known to have intensified during this period. On the contrary, both absolute and relative dates from these sites indicate that these settlements predate the nineteenth century (Bignagwa 2012), suggesting that some other cause lay behind their creation. Generally, it can be said that most of the written texts consulted for this study tended to lack sufficient spatiotemporal specificity of historical events against which the archaeological data could be tested and cross-referenced, making it even more critical to also incorporate the oral evidence.

International Perspectives

Current historical archaeological research is well placed to contribute to ongoing debates on the

framing of capitalist global relations, which is currently receiving considerable scholarly attention. Specifically, research findings from several studies in the region help assessments of the place and status of indigenous Africans within the nineteenth-century world economic system that ringed the Indian Ocean. For example, given the evidence for localized selectivity in the type of imported trade goods found on nineteenth-century sites in different areas and used to procure ivory and other key raw materials, it can be argued that local consumers were not simply passive receivers of "trinkets." Instead, as argued by Croucher (2011), these commodities were actively desired by nineteenth-century East African consumers and like any fashionable commodity were highly subject to shifting fashions and cultural recontextualization.

For example, in her work on nineteenth-century Zanzibar clove plantations, Croucher notes the dominance of mass-produced European ceramics on such plantations, which contrasts with their virtual absence on settlements outside the plantations. In interpreting these in the context of the development of consumer culture and identity during the nineteenth century, Croucher argues that the imported wares had social functions, such as for reinforcing social bonds between groups of plantation residents and bridging the gap between plantation owners, enslaved laborers, and others living upon plantation sites. She further argues that neighborliness, which was a crucial part of Zanzibari plantation society, was cemented through reciprocal obligations of lending goods that had acquired social value (including those mass-produced imported ceramics) to those in need. After all, residents on plantations shared a common cultural understanding that such dishes were to be used at particular social occasions. Thus, Croucher (2011: 180) is of the view that the social norms of reciprocity not only worked to cement social unity and community cohesion but also served to highlight wealth disparities and unequal relations between those who had and those who did not have such socially valued goods.

Moreover, as Croucher (2011: 184) argues, acceptance or rejection of European manufactured goods was likely predicated on preexisting patterns of taste in the new markets to which these goods were taken by the passing caravans. Along the Lower Pangani River (northern Tanzania), for example, the use of pre-European contact shell beads (obtained from the coast) would have helped to shape the variety of beads desirable in local markets during European contact period, such that changing densities of beads of a particular color and/or shape in particular assemblages better reflect the manner in which commodity exchange was incorporated into local cultural contexts than shifts in the direction or scale of international bead supply. Thus, for example, at former settlements along the nineteenth-century northern caravan route in the Pangani Basin, cylindrical white glass beads dominate the imported glass bead assemblage throughout their occupation, which ended in the early twentieth century. Despite other shapes and colors of beads being readily available, oral histories indicate that the local Zigua occupants chose white beads because of the significance of the color white in a variety of cultural practices. For instance, the beads were used as charms to protect children from being seen by witches. They were also worn by young men when wooing women, by all participants in clan rituals, and by those attending cultural ceremonies to enshrine someone to a traditional title like chieftainship. Even though these beads were cheap and easy to acquire, so were other types, and the archaeological evidence suggests that Wazigua were highly selective in their consumer choices, even when presented with a wide range of global commodities. Contemporary historical sources support this and suggest that bead manufacturers in Europe adjusted their production strategies to take into account such variations in "taste" and cultural preference (Palaver 2009), underlining Croucher's observation that "capitalist forms and processes are continually made and unmade" (2011: 186).

Future Directions

Recent archaeological work undertaken in East Africa serves to demonstrate how historical archaeology studies can and should be designed with a view to interrogating multiple sources, both written and non-written. In doing so, such studies

will serve to supplement, cross-reference, and/or correct oral and written sources, thus bringing a new understanding of the society under study. It was through a combination of multiple sources, for instance, that the Lower Pangani historical archaeology study discussed above was able to develop new understanding of several issues pertaining to the status and general lives of Africans as they were steadily integrated into the global nineteenth-century economic system. Other studies are now starting to explore the nature of the colonial encounters that followed and in particular how European powers used space and architecture to exert and express their authority. Others still have begun to explore the changes in the nature of slavery and especially the shift from a "domestic"-oriented system with a limited export component to one dominated by larger-scale export coupled with the growth of local plantation-based chattel slavery. There is also growing interest in the underwater heritage of the coastal zone, both in terms of shipwrecks and the extraction of marine resources.

There are many gaps, however, partly because it is in only recent decades that the archaeology of the last c. 500 years has become a legitimate field of study. Topics that would warrant further investigation include investigating responses by African societies to the opportunities and constraints introduced by the arrival of non-African groups, and subsequent repercussions of these in creation or destruction of ethnic identities; research on the perceptions, valuation, and processes of integration and consumption by African groups of a variety of exotic imported commodities in the region; and the nature of land use, subsistence base, and settlement pattern of African groups prior to, during, and after contacts with non-African groups.

Cross-References

- ▶ Colonial Encounters, Archaeology of
- ▶ Connah, Graham
- ▶ Kirkman, James
- ▶ Oral Sources and Oral History
- ▶ Posnansky, Merrick
- ▶ Schmidt, Peter R.
- ▶ Southern Africa: Historical Archaeology
- ▶ Trade Beads in Historical Archaeology
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East Africa: Museums

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Introduction and Historical Background

The first East African museums, like other early museums in Africa, were introduced during colonial times. They were started either by amateurs or professionals interested in particular scientific disciplines such as earth sciences, botany and zoology, archaeology and paleontology, and ethnography or by colonial governments as places of study, collecting and exhibiting nature, and/or local people's cultural heritage.

The museums in East Africa were at the beginning all located in the big capital cities notably Nairobi in Kenya, Dar es Salaam in Tanzania, and Kampala in Uganda. These often took the form of natural history museums with strong ethnographic component to depict "the natives and their cultures," the geology and land forms, and nature in "its raw form" of animals and plants. This was mostly for the colonialist administration and settler communities' consumption and enjoyment.

The museum was seen as a mirror of local traditional society and nature. To Africans, their culture, and their imaginary natural environment he coexisted with that was portrayed as a "unique jungle" with its "Big Five". The museum also provided an excellent research space and a facility for international partnerships in many scientific disciplines for amateurs, and enthusiasts, as well as well-established researchers of European and North American extraction of whom many were from the elite families of colonial-settler background.

Until the early 1980s, East African museums were therefore nongovernmental organizations that provided entry points to the unlimited research opportunities within East African countries. They attracted partnerships with Western researchers eager to establish a foothold in the continent, renowned for its rich heritage, including evidence of human origins. This made the museums in East Africa an exclusive property of the privileged white elite, who even after independence continued to ensure that their interests remained intact through ensuring powerful patronage structures both at local/political and international levels.

The museums in this context were therefore divorced from the common person, the African majority who were part of the objects on display. More so, the museums they were located in areas where Africans were rarely allowed to venture during the colonial periods except as servants. When they were, it was within very specific days

and times. School children were transported in and out by buses. Like Western museums, most remained places of curiosities with little to do with national identity and community ownership.

With independence and the subsequent development of African heritage professionals, who began to question the status quo, changes came slowly but steadily. Kenya, in particular, with the interest and energy of the renowned Leakey family who collectively ran its museums for over 30 years, and who used their name and international contacts to promote the museum, developed a complex and elaborate museum system with strong research capabilities comparable to any major museum in the world.

Key Issues

The National Museums of Kenya, the name the museum came to adopt at the independence in 1963, grew to become possibly the most complex, most diversified, and most research-endowed museum institution in the whole of Africa up to the present. Today, the National Museums of Kenya (NMK) is the government custodian of cultural heritage with a chain of regional museums all over the country. It hosts the East African Herbarium, the nation's Centre for Biodiversity, and world-class centers of paleontology, archaeology, and entomology, among others. The museum is also a host to the world-re-known Institute of Primate Research, a World Health Organization affiliate that carries out research on malaria and HIV pandemic, among others.

The National Museums of Kenya had the upper hand in sourcing funding, developing networks of international partnerships, and creating up-to-date research and museological facilities that up to now are incomparable with the other East African museums. Thus, as much as Dar es Salaam was reasonably developed because of the interest of the Leakeys in the study of human origins and the role of Olduvai Gorge and the Laetoli footprints, it appears that there was a conscious decision on their part to ensure Nairobi remained the center of excellence in East Africa.

This is explained by the fact that all the important finds from the Tanzanian sites including the human-origin-related materials were all kept at the National Museums of Kenya. This was possibly due to Tanzanian's socialist approach to governance and the authorities' nationalistic tendencies as opposed to Kenya that embraced the Western capitalist system with people in authority willing to provide patronage to the dominant white elites within the museum and their international partners; it was perceived as a safer ground to invest and carry out research compared to other East African museums.

Uganda, on the other hand, seemed to have not prioritized the role of the museum despite the museum having been established there in a custom-built modern architectural structure of the 1950s. Thus, coupled with its early history of turmoil and coups, Uganda Museums stagnated for a long time partly because they were part of the underprivileged departments of the government. This was demonstrated as recently as 2011 when the government contemplated demolishing the museum, building a commercial complex, and then allocating the Uganda Museums a few rooms to operate from.

With the Africanization of the museums from the 1990s, the East African museums have come to play crucial roles within their communities. The National Museums of Kenya and the National Museums of Tanzania have significantly restructured and reformed incorporating in their programs the needs of the various communities, listening to and admitting many voices into their spaces and therefore becoming places of dialogue.

Today the museums can be said to be an embodiment of the cultures of people in their respective countries, the representation of the identity or identities of the nations and their achievements. The museums have become forums for dialogue and critical thinking and at times even providing spiritual spaces where communities rally around shared heritage. The village museum in Dar es Salaam, for example, brings the villages of Tanzania with their architecture, cuisine, art and music, rhythms, smells, and sounds to the city by providing opportunities for the various ethnic groups to reenact their cultural heritage in the city setting including in building construction, culinary, and other artistic activities.

These early and major East African museums have today moved away from the confines of their grand walls as houses of wonder, collections of

the "rare," and fortifications of the untouched, depicting "traditional peoples in their natural environment" to open friendly spaces of memories, shared experiences, cultural activities, and representation of many voices, that are included in the thinking and production of the heritage.

This development of the East African museums can be categorized into roughly four phases:

Phase one was the colonial-built monumental natural history museums with a rich ethnographic component depicting the "innocent traditional African" and his material culture in his natural environment. These were the "do not touch and curator knows it all" type of museums similar to many in the West. They had a selected community of viewers who were otherwise nonparticipants in the making of the museum or their exhibitions. However, they also had a strong and heavily patronized community of elite researchers who ensured its status quo. They were therefore more elitist institutions with interests in research and the provision of platforms for international researchers to work in East Africa, in addition to their resident community.

Phase two came with independence and saw the slow opening up of these museums to others, mostly locals, who for years were not considered stakeholders, hand in hand with the training and absorption of African heritage professionals into positions of responsibility. It was a phase that lasted from the 1960s to the beginning of the 1990s. It also saw the expansion of the museums from the capital cities to the regions to try to diversify museum benefits. However, even at this stage, the initiative to have the museums in the regions still emanated from the top down, from the big city museums to the regions. It is a period that saw the construction of a number of museums in provinces and the slow involvement of communities.

Phase three was from the 1990s to the beginning of the 2000s. This saw a conscious effort on the part of the museums administration to restructure and meet some of the needs of their communities, by involving the communities much more in museum activities. It saw the mushrooming of museums including the involvement of communities in the development of some exhibits. The museum went into partnerships with communities and other bodies including the private sector and NGOs, to create programs beneficial to their communities' well-being. It saw a relationship developing between museums and communities. Training centers for young people in craft as part of saving the heritage as well as to economically empower communities developed in places like Fort Jesus, Mombasa; Gede in Malindi; and Lamu Museums in Kenya. It is also a period that saw communities seeking East African museums' support for the establishment of museums and other cultural institutions in local areas starting a bottom-up approach in heritage relations.

Phase four saw the continuation of phase three but also the introduction of community museums. The community museums are developed either in partnerships with the mainstream government museums, with other NGOs, or purely through community initiatives. There are some however that have been collectively started by the three bodies. The phase has also seen the introduction of *culture houses* that possibly respond to community needs that have not been addressed by mainstream museums in the past.

This latest phase has also seen some governments start to vigorously establish museums dealing with issues of politics and memory. Rwanda, for example, where genocide had taken place during this time has not only started memorial museums for the victims in various parts of the country but also the Presidential Palace Museum shows political atrocities of the past regime. It has planned a Liberation Museum to showcase the role of the liberating army at the time of the genocide. This however is not uncommon in the region as in 1977 the government of Tanzania established the Arusha Declaration Museum that celebrated the country's new socialist political vision.

Both Rwanda and Burundi have joined the regional body, the East African Community, and as such could be considered under this regional survey. There are also other countries within the Eastern African region with museums that could

also be considered and that have had museums within their boundaries. These include Ethiopia and Eritrea. There are also some that have either lost museums through wars such as Somalia or which have no museums such as South Sudan or have little documentation on the same such as Djibouti. The countries and their respective museums are summarized below.

Kenya

National Museum of Kenya

Founded in 1910 as a Natural History Museum, it was later named the Coryndon Museum after Sir Robert Coryndon and moved to its present location where it was officially opened on 22 September 1930. It was renamed the National Museum of Kenya after independence in 1963 and today is called National Museums of Kenya, Nairobi Museum, after the restructuring in the 2000s.

Fort Jesus Museum

Built by the Portuguese in 1593, it became one of the most important military positions on the western Indian Ocean. It changed hands many times in its 400-year history becoming a museum just at independence. It is both a monument and a museum. Today, Fort Jesus is a world heritage site, one of the six currently found in Kenya.

Lamu Museum

Lamu Museums are located in the Lamu Archipelago, in the historic Swahili town with the same name. Founded in the 1970s, the Lamu Museum is one of the most important museums depicting the Swahili heritage and its rich history. There are also the Swahili House Museum, the German Post Office, and the Lamu Fort, all of which together with the old Lamu stone town comprise the Lamu World Heritage property. Lamu is well known for its architecture, the Maulidi religious festival, and the Lamu cultural festival, in which all of which the Lamu Museums are involved.

Kitale Museum

This was the first of the inland museum to be developed in Kenya, and its initial acquisitions were comprised of **c**ollections of insects, other animals, and books collected by Col. Hugh Stoneham (1894–1966). **T**he museum has a rich ethnographic collection from surrounding ethnic groups and is also known for its environmental conservation.

Kisumu Museum

Opened in 1980, this lakeside museum mostly houses cultural and scientific material exhibits on issues on western Kenya. It comes together with a complete Luo homestead and a snake park.

Meru Museum

Located close to the foothill of Mt. Kenya, the Meru Museum was created to conserve the cultures and traditional practices of the local Meru-speaking people. The museum was founded in 1974 in an old historic building and today, among other activities, carries out educational programs mostly for schools.

Karen Blixen Museum

This is the former house of Danish author Karen Blixen, whose life story was made into a movie that became the Oscar award–winning film *Out of Africa*. Built in 1910, it was later donated by the Danish Government to the then newly independent Kenya in the 1960s. It was made a museum in the 1980s.

Kapenguria Museum

Located in the Rift Valley of Kenya, this is the prison in which the six Kenyan freedom fighters deemed most dangerous, including Mzee Jomo Kenyatta, the first president of Kenya, were detained at the beginning of the 1950s. It was opened in 1993 to preserve the memories of these influential leaders in their role in the struggle for independence. The museum houses books and documents in a memorial library.

Other museum sites include:

Hyrax Prehistoric Site and Museum

This is an archaeological site of the Late Iron Age/Late Stone Age in which a small museum was established in 1965. This was further expanded in 2000.

Desert Museum

The Desert Museum is cultural museum opened in 2008 on the shore of Lake Turkana and dedicated to the unique culture of this region.

Kariandusi Museum
This museum is located in the Rift Valley near Nakuru where an archaeological site with the first discoveries of Lower Paleolithic sites in East Africa were first found.

Narok Museum
Located in Narok town, the museum preserves the beauty and rich traditional culture of the Maasai and other speakers of the Maa language.

Rabai Museum
Founded by the first missionaries to Kenya and built in 1846, the Krapf Memorial Museum was founded in 1994 to provide formal and perpetual reminder of monumental events during the advent of early missionaries. It was built with the permission and good will of the local community elders who continued to practice their traditional religion including maintaining their old Kaya settlements and cultures, now listed under two world heritage conventions, the 1972 and the 2003.

Wajir Museum
Located on the dry northeastern part of Kenya, the museum was opened in 2011 to give visitors a glimpse of the rich cultural, historical, and natural heritage of northeastern Kenya. Northeastern Kenya is a dry land with mostly pastoralist Somali whose territories expand to cover a major part of northeastern Kenya and southeastern Ethiopia.

Tambach Museum
This museum is located in the Rift Valley in Tambach, one of the oldest towns in the interior of Kenya established in the 1920s as a British colonial center of administration. Opened in 2011 to safeguard the Tambach heritage and the culture of the Keiyo and Marakwet, it is located in the unique mountainous landscape of the rift valley.

Malindi Museum
This is an ethnographic museum which showcases the Mijikenda cultures of the coastal and the immediate hinterland of Kenya.

Gede Museum
Locate about 16 km from Malindi, Gede is one of the most important old Swahili settlements. Founded around the eleventh century, it reached its Golden Age in the nineteenth century. Today it is represented by monumental structures in a forest setting. A museum to exhibit this rich Swahili heritage was funded by the European Union in the 2000s. Gede is also the host of a butterfly exhibition as well as a very successful museum/community joint project on butterfly farming and bee keeping.

Tanzania

Dar es Salaam National Museum
One of the first museums to be founded in East Africa, it was established in 1934 and open to the public since 1940. It was originally conceived as a memorial museum dedicated to King George V but with independence changed to articulate the history of Tanzania. It houses some of the findings by the Leakeys from Olduvai Gorge as well as the site of Kilwa. Recently it went through a restructuring and rebuilding period supported by the Swedish government and today hosts what has been referred as the House of Culture.

Village Museum
This is a unique open-air museum that was established in 1996 in Dar es Salaam and showcases among other activities traditional architecture from various peoples and various parts of Tanzania. Its activities include dances, food and food preparation, poetry and oral tradition, art, and craft. It brings together Tanzanians of all cultures, ages, and upbringing and offers opportunities to experience home away from home for many Tanzanians with rural backgrounds in Dar es Salaam.

Natural History Museum
This museum was opened in 1987 and is dedicated to human evolution and entomology.

Arusha Declaration Museum
Arusha Declaration is one of the most important episodes in the history of Tanzania as a country. It was the time that the founding father of the country, Mwalimu Julius Kambarage Nyerere, and his colleagues decided that Tanzania would become socialist. Referred to as Ujamaa, or family/

community, the declaration that took place in the town of Arusha changed the course of Tanzania. It became a socialist in a manner referred to as African socialism. To remember this, a museum was constructed and opened in 1977. It exhibits among others documents of the colonial history of Tanzania, the fight for independence, and the Arusha declaration where Julius Nyerere outlined his political vision.

Nyerere Museum

This museum commemorates the life and contribution of the first president of Tanzania, Mwalimu Julius Kambarage Nyerere. Established in 1999, it is located in Butiama, the birth place of Mwalimu Nyerere. On exhibition are items related to Nyerere's personal and political life. Like the other heritage places of memory and politics, this is one of the spaces that speak to the people in the voice of struggle, liberation, and independence, something the museums have come to be closely associated with in postcolonial Africa.

Uganda

Uganda Museum

Uganda Museum is one of the oldest in East Africa and yet one of the most challenged. Founded in 1908, it still pretty much retains its twentieth-century atmosphere with artifacts that include musical instruments, hunting equipment, weaponry, and archaeological and entomological materials. As noted above, the museum is fully government controlled, giving it little leeway to innovate and move forward as the other East African museums.

There are other private as well as community museums in Uganda including one that commemorates the death of so many in the north of the country due to the rebel army called the Lord's Resistance Army.

Burundi

There is little information concerning the Burundi museums. This is a country that has also undergone wars over the years although now there is relative peace. Burundi has three recorded museums, namely, Burundi Geological Museum, Burundi Museum of Life, and Burundi National Museum.

Burundi Geological Museum

Located in Bujumbura, the capital of the country and as the name suggests was founded to showcase the geology of the country.

Burundi Museum of Life

The Burundi Museum of Life is located in the city of Gitega.

Burundi National Museum

The National Museum of Burundi like the Burundi Life Museum is located in the city of Gitega and not the capital Bujumbura. It was founded in 1955 and showcases the country's heritage.

Rwanda

Rwanda, despite its relatively small size, has many museums. The museums are organized under a centralized system called the Institute of Rwanda Museums. This country that underwent political turmoil and genocide has recovered to put in place museums of memory that are meant to remind people of these unfortunate events with a view to avoid repeating them. Here many museums have been put up as remembrance as well as healing spaces. It shows how museums can play roles that traditional museum practice never envisaged.

The current president of Rwanda, Paul Kagame, has a particular interest in museums and while officiating at the launch of the Liberation Museum in Mulindi, Rwanda, was quoted as telling the residents that "we must know where we come from to know where we are going and what we must do to get there. Today it is your responsibility to work hard to ensure the seed sown by the liberation struggle continues to benefit all Rwandans. I am confident that building on our history, we will accomplish even more in the coming years." He further stated that "this museum becomes part of other museums in the country that have a lot to teach us when it comes to Rwandan history. It will always be a memorial for RPF liberation struggle."

Ethnographic Museum

This museum is located in Huye and was built in 1987. It houses ethnographic, historical, artistic, and archaeological collections.

National Art Gallery

The National Art Gallery is located in Nyanza District and originally was built as a palace for King Mutara III Rudahigwa. It displays contemporary artwork that Rwanda is so well known for and has exhibition on traditional life style and national history.

Kings Palace Museum

This is located in Nyanza Residence of King Mutara III Rudahigwa that was restored to its nineteenth-century state.

Presidential Palace Museum

The Presidential Palace Museum is located in Kigali and served as the home to the former Presidents Juvenal Habyarimana who served before the genocide and Pasteur Bizimungu who served after the genocide period ranging from the 1970s till late 1990s. It provides a glimpse how the former lived.

National History Museum

This museum was dedicated to Dr. Richard Kandt, a German doctor and explorer who embarked on an exploration of Rwanda in 1897, searching for the source of the Nile River. The National History Museum aims to explain the richness of Rwanda's nature.

The Environment Museum

Being built currently in Karongi, this museum may be the only museum of the environment in Africa. Thus, while there are environmental exhibitions in most natural history museums in the continent, there is none that is dedicated totally to the subject of environment alone.

Liberation Museum

This is the most recent museum in Rwanda, and the foundation stone was laid in December 2012 in Mulindi, Rwanda, on which occasion President Kagame stated that the Liberation Museum will serve as a memorial for the 1990–1994 liberation struggle mainly for Mulindi residents and for Rwandans in general. He further observed that the museum will always tell the liberation story and explain to younger generations the role it played toward achieving the developments that are currently taking place in the country.

Ethiopia

Ethiopia is a large country with extremely rich history and rich heritage founded in its long Christian, Islamic, as well as traditional cultures. There are numerous museums, but most of these are church run and owned. Thus, in every region where there are the orthodox churches, one finds a collection of church materials organized in museum form that include textiles, manuscripts, musical instruments, and even past royal regalia. These church museums are found in Addis Ababa, Aksum, Gondar, Lalibela and many other places where the church has had a strong foothold and constructed cathedrals.

Ethiopia however is also known for its hominid finds and has contributed immensely to the understanding of human origins study and debate. In addition to this, Ethiopia was for centuries a great empire with centralized governments that left their marks behind in terms of material culture. It is a diversified country with a population of over 85 million people and tens of ethnic groups, each with their material culture. These are displayed mainly in two museums: the National Museums of Ethiopia and the Ethnographic Museum in Addis Ababa University.

National Museum of Ethiopia

The National Museum of Ethiopia was founded in 1958 to promote and facilitate archaeological research mission in the northern part of Ethiopia by French archaeologists.

The museum started its activities by exhibiting objects from these excavation missions. With the establishment of the Ethiopian Cultural Heritage Administration in 1976, the idea to open a national museum was mooted and supported by the government. Today, there is a well-established museum with exhibition of various kinds including the numerous hominid finds that Ethiopia is so rich in.

The Ethnographic Museum

Ethiopia's imperial past is very rich and the country was ruled until the mid-1970s by emperors who had immense power and wealth in a feudal system of government. Emperor Haile Selassie, the last in a long line of emperors, donated most of the imperial items exhibited in the museum. The museum is located within Addis Ababa University and also acts as a teaching museum.

The Red Terror Museum

This museum is located in the city of Addis Ababa in the Bole area. It represents the period commonly referred to as the Red Terror, during the administration of the military or the Dergue. It was a period of oppression, jailing, and killings, and the museum depicts the excesses of this particular period.

Eritrea

Located on the Red Sea, the country of Eritrea was a gateway to the northeastern part of Africa. Both the mega sites of Quito and the seaport of Adulis are located here. The country has a rich heritage but was colonized by the Italians, the British, and the Ethiopians, all of whom left some mark in its history. It shares the great depression of Afar with Ethiopia, an area that has produced early hominid evidence in both countries.

Eritrea has two major museums under the National Museums of Eritrea, namely, the National Museum of Eritrea in Asmara and the one in the port city of Massawa.

National Museum of Eritrea, Asmara

This museum was inaugurated in 1992 at the governor's palace in the capital Asmara. It was however moved to its present location at the former Comboni Sisters School for Women in 1997. Its main functions are to promote Eritrean history both within the country and abroad, to investigate new archaeological sites, and to explore and exhibit the history of Eritrea.

The National Museum of Eritrea, Massawa

This museum, located in the port city of Massawa, is rich in archaeological, ethnographic, and historical materials that are well exhibited. As a port city museum, it has in its exhibition a rich representation of marine life, particularly on the marine life of the very long coastal area of Eritrea. The museum is however well known for its exhibition of the war of independence from Ethiopia that demonstrates the life, tribulations, and successes of the freedom fighters against the Ethiopian army. It has a huge collection of weapons some captured from the enemy side and then reworked to create different types of weaponry. It also shows the struggle of life in the trenches where everything was made by the fighters ranging from guns and shoes to medical equipment.

Djibouti

There is no known museum at the moment in Djibouti although it is an interesting little country on the western seaboard of the Indian Ocean and popular with military. There are many foreign military bases there. There is a plan through the presidency to start a museum that will showcase the people and heritage of Djibouti.

Somalia

Somalia had a national museum with rich collections of ethnographical, archaeological, and other materials, but all these were looted and some destroyed during the overthrow of the dictator Siad Barre in the early 1990s. Since then, Somalia has remained without a working government and has no museum. The breakaway Somaliland that is also very rich in heritage including rock art has no functioning museum but has within its Ministry of Culture a Department of Museums and Sites.

Cross-References

- ▶ Heritage Museums and the Public
- ▶ Museums and Memory Experiences
- ▶ Museums and the Distortion of Archaeology for Political Purposes

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East and Southern African Neolithic: Geography and Overview

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State of Knowledge and Current Debates

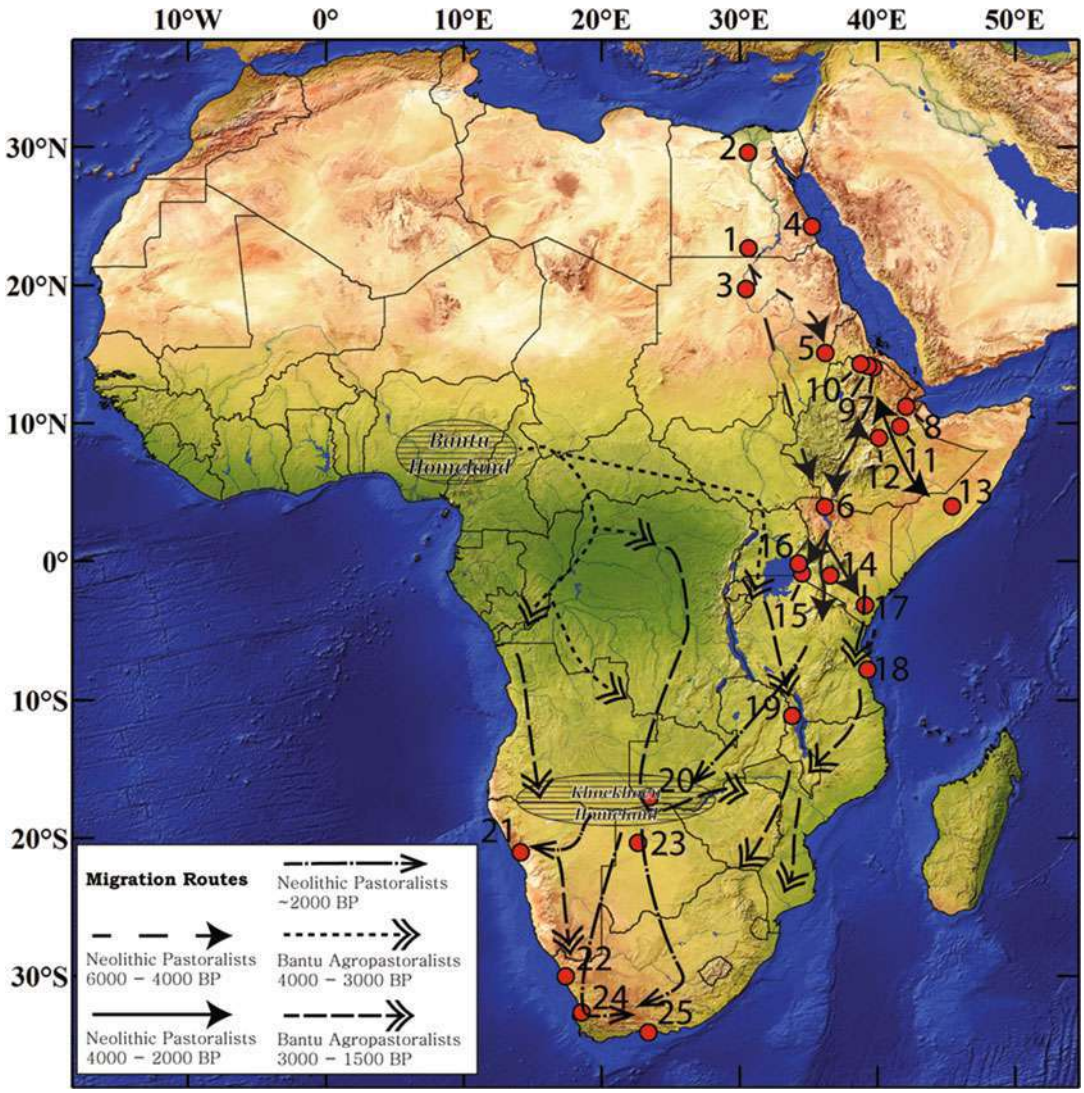
The Neolithic period of eastern and southern Africa was a form of niche fulfillment when viewed within the context of its origins and distribution. In Africa, Neolithic cultures include those groups who herd domesticated animals, use stone tools and ceramics as part of their subsistence package. Climatic and demographic pressures after 6000 BP pushed Neolithic pastoralists living in the Nile River Valley southward, and the savanna habitats of eastern and southern Africa that these migrants encountered were attractive ecosystems rife for herding. The early Neolithic pastoralists in eastern Africa tended to be less mobile and had a broad-based subsistence compared to later pastoral groups, who colonized southern Africa after 2000 BP. When placed within the larger paleoenvironmental and cultural context, pastoralists adapted their subsistence to specific ecosystems based on the potential of the land to provide adequate sustenance for themselves and their livestock, but there are constant demographic pressures facing pastoralists who have low productive yields per unit of land compared to sedentary farmers.

In this entry, the Neolithic period in eastern and southern Africa will be reviewed from the perspective of how animal herders occupy distinct niches on a landscape. The current state of archaeological evidence for early pastoral cultures in the subcontinent will be examined to evaluate how prehistoric people may have opportunistically exploited specific ecological niches in the landscape. The present-day mosaic of genetic and linguistic groups across the subcontinent is used to fill in the gaps of knowledge where archaeological data is insufficient to chronicle the demographic and subsistence shifts throughout the late Holocene. The arrival of Iron Age agropastoralists in southern Africa will also be explored in order to attempt a clarification what the Neolithic entailed in this specific context. African Neolithic contexts are not a uniform culture or subsistence adaptation, and people have remained flexible in the ways they procure food, water, and shelter from the land into the modern era.

The Neolithic in Eastern and Southern Africa

It is easier to define the beginnings of the Neolithic period of eastern and southern Africa than the end. Traditionally, archaeologists ascribe the term "Neolithic" to the time period when food production techniques begin in an area where hunting and gathering had been exclusively

practiced in the past. Archaeobotanical research now suggests that domesticated plants and animals were introduced simultaneously in northern Africa (Out et al. 2016), but domesticated animals, not plant cultivation, are the hallmark of the Neolithic in eastern and southern Africa (Marshall and Hildebrand 2002). The origins of domesticated animals in Africa lie in the north and the demic routes of introgression into eastern and southern Africa extend from these homelands (Fig. 1). The near simultaneous arrival of Iron Age and Neolithic pastoralists into southern



East and Southern African Neolithic: Geography and Overview, Fig. 1 East and Southern African Neolithic: Geography and Overview, Fig. 1 Natural Earth Map (http://www.naturalearthdata.com) of Africa showing routes of demic migration and archaeological sites mentioned in the text. *1* Nabta Playa, *2* Fayum, *3* Kerma, *4* Sodmein Cave, *5* Western Gash River, *6* Koobi Fora/Turkana Basin, *7* Quiha, *8* Asa Koma, 9 Danei Kawlos, *10* Gobedra, *11* Laga Oda, *12* Lake Besaka, *13* Gogoshiis Qabe Rockshelter, *14* Enkapune ya Muto, *15* Gogo Falls, *16* Usenge 3, *17* Galana River sites, *18* Rufiji River Delta, *19* Fingira and Hora, *20* Kunyengenya, Galumano, Luso, *21* Snake Rock, *22* Spoegrivier Cave, *23* Toteng, *24* Kasteelberg and Elands Bay, *25* Robberg Peninsula (Migration routes are primarily constructed from Russell et al. (2015) and archaeological data)

Africa and their side-by-side survival with foragers and farmers into modern times are the basis for shifting settlement and subsistence practices through the Late Holocene. In order to understand the roots of the eastern and southern African Neolithic, the evidence for the origins of pastoralism in northern Africa will be briefly reviewed.

North Africa

The roots of animal herding cultures of eastern and southern Africa are found in the now desiccated landscape of the eastern Sahara. Genetic data supports the notion that a rapid demographic expansion of the genetic forebears of the Niger-Kordofanian (Bantu), Nilo-Saharan (Nilotic), and Afroasiatic (Cushitic) language families (broadly falling in the L2 mtDNA haplotype) occurred at the end of the Younger Dryas between 10,000 and 12,000 years BP (Trombetta et al. 2015). It was during this period that experimentations with domesticating cattle (*Bos taurus*) are thought to have occurred in the eastern Sahara (Jórdeczka et al. 2013), although this view is not universally accepted (Linseele et al. 2014; Stock and Gifford-Gonzalez 2013).

At 10,000 years BP, the Sahara was a very different ecosystem than it was during the previous stadial period or what it is like today. The zenith of the so-called African Humid Period (AHP) saw the Sahara transform into a vast network of lakes and swamps that hosted hippos, crocodiles, a wide array of bovids and communities of hunter-gatherers who lived adjacent to the water bodies and had broad-based subsistence patterns. Pan-African distributions of "wavy line" and "dotted wavy line" ceramics in conjunction with bone harpoons and evidence for high predation on fish and riparian resources is evidence for a transcontinental movement of people during the early Holocene, occurring in tandem with population growth (Manning and Timpson 2014).

As climate conditions began to dry out, productive ecological biomes contracted around permanent sources of water. At archaeological sites adjacent to Nabta Playa in the southwestern Egyptian Sahara and further north in the Fayum region, there is evidence that animals and people were tethered to the same resources. It is during this period that the earliest domesticates appear to have been introduced into northern African from southwestern Asia (Barich 2016). Leaving contentious claims of cattle in Nabta Playa, the earliest, unambiguous domesticated animals date to "ca. 5600 cal BC" (7550 cal. years BP, if taken sensu stricto) in the form of goats (*Capra hircus*) from the site of Fayum (Linseele et al. 2016) and within 200 years at Kerma in Upper Nubia (Honegger and Williams 2015). Sheep (*Ovis aries*) were present in the Nile Delta, eastern Sahara, and Red Sea region by 7000 years BP (Muigai and Hanotte 2013). Goat and/or sheep remains have been recovered in contexts dating to ca. 7250 years BP in Sodmein Cave in the Red Sea Hills (Vermeersch et al. 2015). Current scholarship indicates that donkeys (*Equus asinus*) were domesticated in the Nile Valley between 7000 and 6000 years BP (Kimura et al. 2013). However, domesticates remain scarce in the archaeozoological record relative to wild animals (and fish) for the next 1500 years. During this period, the relationship between humans and these animals transformed into one of co-dependency. As lakes were drying up, humans needed a dependable food source and cattle had been bred to the point where their natural foraging instincts had disappeared.

Early domesticates were probably part of an integrated exchange system spanning the Sahara and Nile River Basin into southwestern Asia in which complex foragers/pastoralists maintained close technological and cultural networks over vast territories. These networks involved seasonal mobility in which riparian areas were utilized extensively during the dry season and grasslands were exploited in the rainy season. As riparian woodlands turned into grasslands by 6000 years BP and grasslands turned into scrubland and sand by 4000 years BP, settlement in the eastern Sahara was abandoned and the extensive exchange network collapsed (Hoelzmann et al. 2001).

Prior to the introduction of domesticated animals, the primary (archaeologically visible) subsistence strategy in the eastern Sahara and Nile Basin was fishing using barbed bone points (a.k.a. "bone harpoons"). Archaeological sites in the Nile Basin have increasing numbers of

domesticated animals represented in their faunal assemblages between 6000 and 4000 years BP indicating the importance livestock was gaining as a resource that was depended upon (Sadig 2010). Settlements with evidence for uses of aquatic, wild terrestrial, and domesticated resources also appear along the Gash River at the western foot of the Ethiopian Highlands around 5000 years BP (Gautier and Van Neer 2006), trickling into the Ethiopian Highlands after 3000 years BP (Lesur et al. 2014). Cultivation of sorghum along the banks of the Nile River also intensified by 5000 years BP (Haaland 1995) and may have further enticed people to accelerate settlement within riparian regions. Cultivated food was only one component of a very broad subsistence strategy practiced in the riverine regions of northeastern Africa, and long-distance exchange networks were maintained with foragers living in the Ethiopian Highlands (Fernández et al. 2007) and Turkana Basin (Wright et al. 2015).

East Africa and the Horn

Shortly after 5000 years BP, Neolithic pastoralists reached the Turkana Basin (Grillo and Hildebrand 2013). In the Koobi Fora region on the northeastern shore of Lake Turkana, harpoon fishing and riparian foraging was replaced with livestock husbandry and intensive riparian foraging. Stylistic commonalities between Nderit tradition (Turkana) and Shaheinab tradition (Sudanese Nile) ceramics (Barthelme 1985), similar subsistence patterns (Marshall et al. 1984), and linguistic reconstructions (Ehret 1998) have been used to argue that there was a middle Holocene migration of Sudanese (Afroasiatic/Cushitic) pastoralists into the Lake Turkana region. This marks the beginning of the "Pastoral Neolithic" (PN) period in eastern Africa, which is defined as animal herding cultures who used ceramics and Later Stone Age (LSA) tools (Bower et al. 1977).

However, the arrows of pastoral diffusion are difficult to untangle during the middle Holocene. Teeth of domesticated cattle have been unearthed from Quiha in northeastern Ethiopia with a stratigraphic date of ~5000–6000 years BP (Barnett 1999). Domesticated animals are found at other sites such as Asa Koma in Djibouti (Lesur 2004), Danei Kawlos in northeastern Ethiopia (Marshall and Negash 2002), Gobedra Rock Shelter in northern Ethiopia (Phillipson 1977), and Laga Oda (Clark and Prince 1978) and Lake Besaka (Brandt 1984) in the northeastern Rift Valley. At the Gogoshiis Qabe Rockshelter in southern Somalia, domesticated goats and cattle were recovered from pre-3500 year BP contexts (Brandt 1986). There is virtually no evidence to suggest a stylistic replacement of indigenous ceramic or lithic traditions in the Horn of Africa such as what is presumed to have occurred in the Turkana Basin (Lesur 2004).

For approximately 1000 years, occurrences of livestock in eastern Africa remain restricted primarily to the Turkana Basin and the Horn. Analyses of obsidians from the Turkana Basin suggest that once pastoralism was established in the region, exchange networks were intense but localized (Nash et al. 2011). There were only small "trickles" of pastoralists south of 3°N prior to 3000 years BP (Bower 1991). There are four published archaeological site locations with domesticated animals south of Lake Turkana prior to 3000 years BP: Enkapune ya Muto in the central Rift Valley (Ambrose 1998), Gogo Falls (Karega-Mũnene 2002) and Usenge 3 (Lane et al. 2007) near Lake Victoria, and Kahinju in the Kenyan Coastal Plains (Wright 2007). All of these sites have evidence for minimal reliance on domesticated animals, but instead show foraging-based adaptations in which domesticated animals became one (relatively minor) subsistence component.

It is likely that the recorded drops in lake levels and increases in xeric plant species documented across equatorial Africa between 4000 and 3000 years BP impeded the spread of transhumant pastoralists beyond predictable resource bases. The environments in which domesticated animals are found during this time period are areas with high topographic relief or are close to permanent water bodies. Furthermore, domesticated animals are found in very low numbers relative to wild taxa during this period from sites outside the Turkana Basin and Horn. It is a distinct possibility that livestock in these settings were rustled from established herds elsewhere and not kept for extensive periods prior to slaughtering (Marshall

2000). In that case, the presence of domesticated animals in equatorial Africa prior to 3000 years BP represented an additional resource within the broad-based foraging complex of those who possessed them and was neither culturally transformative nor even necessarily permanent.

From 3000 to 2000 years BP, a drastic shift in the relationship between humans and domesticated animals occurred among people living in the grasslands of eastern Africa and in the Rift Valley. The number of known PN sites from this period grows to several dozen and there are enough pastoralists on the landscape to form patterned cultural differences between different site types.

- *Eburran 5* sites are those where there is evidence for a limited acquisition of domesticated stock, used ceramics, but maintained the same general stone tool traditions (long, narrow blades and microliths, narrow endscrapers, sidescrapers, and microburins) and a broad-spectrum foraging patterns from preceding periods (Wilshaw 2016). These sites are located on savanna and forest ecotones and are mostly known from the Central Rift Valley.
- Most *Kansyore* sites are restricted to the areas adjacent to fluvial systems and Lake Victoria and are delayed-return hunter-fishers-gatherers who adopted domesticated animals by as early as 4500 years BP (Prendergast 2010b). The Kansyore ceramic tradition dates to as early as 6000 years BP and includes hemispherical bowls that are highly decorated with circular bands of rocker stamp and punctate impressions (Dale and Ashley 2010). The lithic traditions are not uniform, which reflects the LSA traditions of each locale rather than being a widely distributed cultural entity (Seitsonen 2010). Domesticated animals were incorporated into an indigenous foraging economy that involved seasonal residential mobility to exploit aquatic resources and access wild terrestrial game available at different times of the year.
- *Elmenteitan* sites were first described by Louis Leakey (1931) and are found in more closed habitat locations along the western Rift Valley above 1900 m. These sites have a higher percentage of ovicaprids compared to cattle and have a distinct lithic industry comprised of large, backed blades, long endscrapers, and large sidescrapers (Ambrose 1984). Elementeitan sites are also characterized as having a distinct pottery style (globular vessels with vertical lugged handles) and using stone bowls as mortuary artifacts.
- *Savanna Pastoral Neolithic (SPN)* sites are distributed throughout eastern Africa and were predominantly cattle pastoralists who supplemented their diets with plains game or, in the case of Lake Turkana, fish (Ambrose 1984). This archaeological entity has also been called "Wilton" (Leakey 1931) referring to the short, broad blades and convex endscrapers that characterize the lithic industry. However, there is considerable diversity in the lithic technologies used, which have stylistic continuity from LSA traditions predating pastoralism. Four named ceramic traditions called Nderit, Narosura, Akira, and Maringishu have been described from SPN sites as well as a distinct herringbone-motif decorated vessel. Stone bowls and other ground stones are commonly found on these sites.

The period from 3000 to 2000 years BP is known as the so-called splash of pastoralism into equatorial eastern Africa (Bower 1991). This has also been conceptualized as the period when pastoralism incubated in the whole of eastern Africa, as opposed to the preceding frontier phase when pioneers ventured into uncharted territories to search for new pastures or escape demographic pressures in their ancestral lands (Lane 2004). During "consolidation phases" of human frontier expansion, intensification and specialization of agricultural production techniques occurs (Alexander 1980; Lane 2004). Indeed, many archaeological sites with high proportions (>90%) of domesticated animals in faunal assemblages are found in the central Rift Valley and portions of the savannas of Kenya and northern Tanzania from this time period. However, many contemporaneous archaeological sites across eastern Africa have evidence that people were non-specialists, maintaining small herds of animals

that supplemented their diets which primarily revolved around foraging of which Eburran and Kansyore forager-(fisher)-pastoralists are good examples. In the case of the inhabitants along the Galana River in the Kenyan Coastal Plains, there is little evidence of significant changes in settlement or technology from 6000 to 1300 years BP (Wright 2007).

The precipitation regime of eastern Africa is bimodal with rainy seasons dictated by the movement of the Intertropical Convergence Zone (ITCZ). However, there is significant spatial and temporal variability in the distribution of rainfall based on global and regional differences in the distribution of solar heat and sea surface temperatures. Generally, eastern equatorial Africa has been wetter in the last 4000 years than during the middle Holocene (Verschuren et al. 2009), while the western portion of the region was driest around 2000 years ago with gradually increasing precipitation thereafter (Nash et al. 2016). In general, rainfall patterns in the late Holocene have been unpredictable on the decadal scale relative to the earlier Holocene (Plisnier et al. 2000), which appears to have pushed people toward exploiting a more predictable resource base. The opening up of a grassy corridor by 2000 years BP in the Lake Victoria region (Chritz et al. 2015) and in south-central Africa (Castañeda et al. 2009; Robinson and Rowan 2017) enabled pastoralists to move into the region without fear of encountering swarms of tsetse flies (*Glossina* sp.), which carry the disease trypanosomiasis (Gifford-Gonzalez 2017).

The use of Y-chromosome and mtDNA genetic markers is used in southern Africa to disentangle the history of population movements over the last several 1000 years (see discussion below). However, using these tools is a much more difficult task in eastern Africa where genetic admixture has been more thorough despite the retention of four language families and over 200 self-identified ethnic groups. One example of this is the Luo ethnic group from western Kenya who speak a Nilo-Saharan language but have shown predominantly Kordofanian/Bantu ancestry (Scheinfeldt et al. 2010). A classic ethnographic analysis tracing the movements of material culture items and marriage partners across ethnic boundaries in the Lake Baringo region of Kenya illustrates that ethnically diverse landscapes necessitate the presence of strong cooperative networks in order to function well (Hodder 1977). There is also evidence of admixture of genes from southwest Asian populations introduced into East Africa between 3300 and 2700 years ago (Pickrell et al. 2014). Cohesive social networks built on complex social values, kinship, and exchange patterns are crucial components of niche fulfillment in precarious ecological settings and have deep roots in African prehistory.

Demic Routes of the Neolithic to Southern Africa

The most commonly accepted demic route of the first livestock into southern Africa holds that a small group of migrants left the Great Lakes region of Uganda around 2000 years BP and settled in Okavango River Basin of what is now northern Botswana and the Caprivi Strip of Namibia. From there, the agro-pastoralists came into contact with Khoe-Kwadi speaking hunter-gatherers, some of whom rapidly adopted a pastoral lifestyle themselves, and went on to colonize vast tracts of southern Africa by 1800 years BP. (The linguistic distinction of the Khoe-Kwadi language family(-ies) is the subject of some debate among linguists (Ehret 2008; Güldemann 2008; Mitchell 2010). One common heuristic device, though not linguistically or biologically accurate, is to refer to pastoral communities of southern Africa as "Khoe" and the hunter-gatherers as "San" (Scheinfeldt et al. 2010; Soodyall et al. 2008).)

Separate migrations of Bantu-speaking agropastoralists occurred down the Atlantic and Indian Ocean coasts between 1800 and 1600 years BP (de Filippo et al. 2012), but there are many potential memes that remain undefined in this explanation of livestock diffusion. It is clear that the spread of domesticated animals did not occur as a coherent population expansion of one culture group from eastern to southern Africa. There has been considerable debate regarding the degree to which livestock herding techniques were adopted by indigenous foragers or whether pastoral people who entered southern Africa settled alongside foragers and there was a gradual melding of

subsistence and culture systems via intermarriage and intercommunity trade. The picture is further complicated by the fact that Bantu-speaking agropastoralists enter southern Africa within 200 years of the non-Bantu-speaking populations ("Khoekhoen"). In the end, there are three primary lines of evidence that can be used to retrace the spread of pastoralism out of eastern Africa: archaeology, genetics, and linguistics. In this entry, these data sets (that are not always in total agreement with one another) will be reviewed to evaluate the current state of knowledge surrounding the origins of Neolithic pastoral economies in southern Africa.

The lack of archaeological evidence for a southward expansion of Neolithic pastoralists from 3000 to 2000 years BP into in the areas that now include southern Tanzania, northern Malawi, northern Mozambique, and eastern Zambia may be as a result of the dearth of well-dated archaeological assemblages from this time period. The majority of archaeological finds in the Rufiji River Delta and surrounding areas (Chami and Kweksason 2003) most likely date to after 3000 years BP rather than before, as the authors suggest. The artifacts, including numerous Narosura ceramic tradition sherds, broad blades, and groundstones, are all suggestive of a well-developed SPN demic expansion from 3000 to 2000 years BP. Ancient DNA analyses from Figira and Hora rockshelters in Malawi show complete genetic replacement of indigenous populations by modern-day Bantu-speaking populations, while genetic succession was less complete among populations in the modern day countries of Kenya and Tanzania (Skoglund et al. 2017).

Early Iron Age settlement of the region adjacent to the Zambezi and Machili Rivers in southwestern Zambia has been reported during the time period when Neolithic pastoralists had likely reached points south of the Zambezi. The sites of Kunyengenya, Salumano, Lusu, and Situmpa have Iron Age ceramic assemblages, evidence for domesticated sheep and radiocarbon ages clustering around 2200 years BP (Katanekwa 1978; Phillipson 1989). The so-called Situmpa Ware is documented across Zambia and Zimbabwe and has radiocarbon ages dating to around 2000 years BP (Clark and Fagan 1965). In the Namib Desert, the site of Snake Rock has ceramics and sheep bones dating to 2000 years BP (Kinahan 2016). Despite intensive investigations, evidence of Neolithic pastoralists have yet to be located in this region from this time period, so other forms of data must be explored to identify the routes by which the Neolithic moved from eastern into southern Africa.

Y-chromosomal genetic evidence shows that pastoralists from eastern Africa en route to southern Africa passed through Tanzania estimated at ca. 2000 years BP (Henn et al. 2008) and shortly thereafter made their way down a corridor along the Zambezi River (Russell et al. 2014). Direct dating of archaeological materials from this region is scant and DNA evidence has a large range of associated error in its clock, so there is much room for speculation regarding who the first pastoralists were, the routes they took to pass into southern Africa, and when it occurred.

Linguistic analyses provide an interpretive framework for understanding the migration of pastoralists and farmers into southern Africa. Early Neolithic groups from southern Africa spoke Khoe-Kwadi languages, which originated from Okavango River Basin. However, Khoe-Kwadi languages also have eastern African links to root words like "year," which have similar cognates in Cushitic and eastern Bantu languages (Güldemann 2008). More tellingly, the overlap of cognates between East African languages associated with Sandawe hunter-gatherers (northern Khoe family) and Khoe-Kwadi are numerous (Ehret 2008; Güldemann 2008). The genetic divergence dates of click-speaking populations in Tanzania (e.g., Sandawe, Hadzabe) from southern Khoe-San populations are estimated to be older than 35,000 years (Tishkoff et al. 2007), so one should expect that proto-Khoe-Kwadi speaking migrants to southern Africa were conversant with animal husbandry as well as foraging subsistence prior to their exodus. When the immigrant northern Khoe speakers reached southern Africa, both genetic and linguistic analyses indicate that the proto-Khoe-Kwadi language family diversified enormously as intercommunity exchange

networks developed (Güldemann 2008; Salas et al. 2002; Soodyall et al. 2008). As will be demonstrated in the following section, the archaeological evidence reflects the diversity of subsistence adaptations that accompanied the movement of people and technological ideas after 2000 years BP.

Southern African Neolithic?

Insofar as it is understood, the southern African Neolithic consists of two facies: herders who hunted and gathered and hunter-gatherers who kept small amounts of livestock (Sadr 2003). As during the pioneer phases of agricultural expansion in many other places in Africa, pastoralism entered South Africa after 2000 years BP as an experimental concept that indigenous hunter-gatherers integrated into their subsistence economies. In the years that succeeded the introduction of Neolithic and Iron Age lifeways into southern Africa, the ecology of the landscape was impacted by the demographics of settlement and non-anthropogenic changes to the climate, which pushed people into narrower subsistence niches.

The earliest securely dated archaeological finds of domesticated animals in southern Africa are comprised of sheep remains at Spoegrivier Cave in Namaqualand dated to 2105 ± 65 ^{14}C years BP (1990–2300 cal. years BP; Sealy and Yates 1994). In archaeological sites studied across Namaqualand, there is no discernable material culture distinction between archaeological assemblages prior to and immediately following 2000 years BP, suggesting that pastoralism in this region was not introduced by a separate, immigrant pastoral group (Webley 2007). Following the introduction of ceramic technology into the region after 1900 years BP, incremental changes to lithic assemblages and ostrich eggshell bead production could represent the evolution of a "herder-forager" culture, distinct from those groups who did not adopt domesticated animals (Sadr 2003).

Sheep and cattle are found at Toteng in northern Botswana directly dated with radiocarbon ages of 2020 ± 40 and 2070 ± 40 ^{14}C years BP (1900–2040 cal. Years BP and 1990–2110 cal. Years BP, respectively; Robbins et al. 2005). In both cases, the vast majority of the faunal remains were from wild animals, with domesticated stock comprising <5% of the total diagnostic NISP assemblage (Robbins et al. 2008). Settlement of the Toteng sites correlates to higher lake levels of Lake Ngami and archaeological materials recovered reflect that subsistence had a distinctly riparian resource predation strategy (Robbins et al. 2008). Occupation of the site throughout the late Holocene conforms to the hunters-who-kept-livestock model advanced by Sadr (2003).

The first livestock economies to enter southern Africa are argued to have preferred sheep as opposed to cattle (Smith 1992). However, Thomas Huffman (2001, 2007) argues that archaeofaunal assemblages from the southern African Iron Age underrepresent the numbers of cattle people actually kept because African pastoralists usually use cattle byproducts (milk, blood) and rarely eat their cattle. He calls this the "Central Cattle Pattern," which is documented in numerous ethnographic examples from across the continent. Subsequent analysis of Early Iron Age phytolith assemblages from dung deposits in southern Africa reflect taxa consumed by small stock and not cattle confirming the hypothesis that early Neolithic pastoralism was centered on tending small stock (Badenhorst 2009). Middle and Late Iron Age agropastoralists were more reliant on cattle and the faunal assemblages from across the region reflect this trend.

Using linguistics, the earliest cattle herding cultures of southern Africa are thought to have been Khoe-Kwadi speakers who settled in the Limpopo Valley approximately 2000 years ago (Ehret 2008; Güldemann 2008). Tom Güldemann (2008) sets the homelands for the Khoe-Kwadi language family in the northeastern Kalahari along what is today the northern borders of Namibia and Botswana. However, the archaeological association between Khoe-speakers and pastoralism between 2000 and 1000 years BP is shaky (Sadr 2008b). Khoekhoen people were known as highly mobile, lugged-ceramic using pastoralists living in the western Cape of South Africa (Sadr 2003). However, none of the antecedent material culture features associated with ethnographic accounts of Khoekhoen

pastoralists (Bollong et al. 1997) are apparent from archaeological sites prior to 1000 years BP. When lugged ceramics first appear in the archaeological record at Kasteelberg in the southern Cape after 1000 years BP, residue analysis from the vessels indicates that they were used to process seal blubber, not milk as would be expected from people who were dependent on livestock (Patrick et al. 1985).

Neolithic pastoralists arrived in the western Cape approximately 2000 years BP and the eastern Cape and western coast regions of South Africa by 1800 years BP and shared the low-altitude plains with hunter-gatherers through the late Holocene (Lewis 2002; Sadr 2015). The site of Kasteelberg has been interpreted as supporting two types of populations: mobile, herder-foragers who subsisted on inland resources and another population of semi-sedentary herder-foragers who exploited coastal ecosystems (Sadr et al. 2003). Small-stock herding at the site is dated to prior to ca. 2000 years BP and shows continuity in the overall archaeological assemblage with previous nonlivestock tending occupations of the site (Sadr et al. 2003).

After the arrival of pastoralism in the Elands Bay region, hunter-gatherers appear to have continued to practice a highly mobile, flexible, opportunistic foraging strategy, which suggests noncompetitive interactions between groups with different subsistence practices (Jerardino et al. 2009). Stable isotope analysis performed on human skeletal materials from the southwestern Cape indicates that the diets of coastal inhabitants had $\delta^{13}C$ values that strongly indicate a very limited mobility range and focus on marine resources (Sealy and Merwe 1988). The persistence of hunter-gatherers into the late Holocene at sites in the southern Natal (Cable 1984) and the northern Cape (Parsons 2003) further confirms variability in the settlement patterns along ecological gradients between highland, fluvial riparian, and coastal lowland settings.

Bone chemistry of two contemporaneous burial sites located within 13 km of one another in the Robberg Peninsula along the southern Cape coast show that there is strong differentiation of dietary patterns between the two populations (Sealy 2006). Individuals buried at Plettenberg Bay show consumption of high trophic marine animals, whereas individuals from Matjes River had a much more broad-based diet with lower trophic marine and terrestrial resources (Sealy 2006). Combined with other archaeological data, the implication of this finding is that there was clear differentiation of subsistence strategies, territories, and cultural practices among late Holocene hunter-gatherers of southern Africa. Therefore, as Neolithic pastoralism spread along the coasts and hinterlands of southern Africa, the perceived usefulness of the resource appears to have varied among the indigenous inhabitants of the region.

The timing and degree of exogenous genetic introgression into indigenous southern African pre-agricultural populations would be helped by detailed genetic studies of living populations across the southern Cone. Unfortunately, most genetic analyses of hunter-gatherer and agricultural populations of southern Africa has been restricted to the geographic outskirts of the region. Y-chromosome and mtDNA analysis of modern Khoe-San populations show deep ancestral links to the L0 haplotype (which is the base of the African population tree according to Gonder et al. 2007) due to intermarriage of the Khoekhoen with indigenous hunter-gatherer populations after 2000 years BP, but there is no genetic discrimination between ethnic groups presently designated as "Khoe" (Khoe-Kwadi language family) and "San" (Ju-ǂHõa language family) (Schlebusch et al. 2012; Soodyall et al. 2008). In contrast, Bantu-speaking populations bear distinct mutations that separate their lineages from the Khoe-San clade and haplotypes (Gonder et al. 2007; Henn et al. 2008; Pickrell et al. 2014; Tishkoff et al. 2009), but these are generalizations to which one cannot ascribe a tight chronology. Linguistically, the same basic relationships bear out unevenly as there is significant linguistic borrowing between the language families although distinct language families can be discriminated between Khoe, Bantu, and other non-Khoe speakers (Güldemann 2008; Hammond-Tooke 2004).

The combined archaeological, genetic, and linguistic evidence from southern Africa supports

the notion that exploitation of ecological niches diversified following the introduction of domesticated stock. There is continuation of the LSA Wilton lithic traditions from the early Holocene into the historic period (100 years BP) with only modest changes in tool frequencies and morphology alongside communities heavily dependent on using copper, tin, and iron (Duncan 2002; Mitchell 2005). The evolution of the Smithfield LSA large endstruck scrapers and distinct pottery tradition of the eastern Karoo after 800 years BP shows evolution of formalized stone tool production techniques despite the presence of iron throughout the region (Mitchell 2005). Due to the high amount of regional subsistence diversity, the separation of Neolithic from Iron Age settlements is not straightforward in southern Africa. The overlap of timing and material cultures of the two archaeologically distinguished groups is the result of similar demographic and ecological pressures, but differences in the migration and settlement patterns are worth noting to contextualize modes of early food production in Africa.

Iron Age Pastoralism. Previous models advanced in linguistics supported the notion of a "bow-wave" expansion of Bantu-speaking, iron-using agropastoralists originating from the West Africa via western Lake Victoria who territorially replaced indigenous hunting (Khoekhoen) and pastoral (Nilo-Saharan and Afro-Asiatic) populations (e.g., Vansina 1995). Although the extent to which there was replacement of indigenous hunter-gatherers varies by geography, this theory has been revised with a nuanced view of incremental movements and intermixing of members of the Kordofanian/Bantu language family as they migrated across other portions of the subcontinent (Eggert 2005). Studies of the distribution of African genetic markers clearly demonstrate the migration of two separate, Bantu clades into southern Africa approximately 2000 years ago, but the lineages are hybridized, as is the archaeological evidence of stone versus iron using and hunting versus pastoral versus farming subsistence patterns (Mitchell 2010).

Gross analyses of ceramic assemblages from southern Africa offer a complex view of culture change in the South African Neolithic period. After 2300 years BP, a few thick-walled ceramics (e.g., Situmpa, mentioned above) and thin-walled variants appear within LSA sites associated with mixed foraging-herding economies for about 600 years (Sadr 2008a). The archaeological site of Bambata and toponymically derived ceramic tradition known from western Zimbabwe is argued to have the earliest occurrence of cattle on the Zimbabwe Plateau and is argued to have predated Iron Age settlement of the area (Walker 1983). However, the clear association between domesticated animals and the 2100 years BP radiocarbon date has been questioned because an older radiocarbon date comes from above the Bambata lens (Huffman 2005). Thomas Huffman (2005) also places thin-walled Bambata pottery within the Kalundu ceramic tradition, which is a subvariant of the Chifumbaze Complex, and associated with Bantu-speaking populations. The other subvariant of the Chifumbaze Complex is recognized as Urewe ceramic tradition, which is an East African Early Iron Age ware from western Lake Victoria occurring after 2500 years BP and spread down the Indian Ocean coast after 2000 years BP in a modified form called "Kwale Ware" or "Early Iron Ware." In Huffman's (2005) analysis, Bambata pottery was first produced by Iron Age farmers in Angola and transported by (Khoe-speaking) foragers (who probably kept some domestic stock) into southeastern Africa around 1750 years BP. The style was later adopted by Bantu-speaking agropastoralists of eastern Botswana and western Zimbabwe around 1600 years BP (Huffman 2005). By 2000 years BP, Bambata ceramics and a lithic scraper tradition spread along the Atlantic seaboard to the southern tip of Africa, but disappeared from the archaeological record in the Zambezi and Limpopo watersheds by 1500 years BP (Sadr 2015).

Settlement data indicates that village-dwelling Iron Age agropastoralists who farmed yams and millet entered southern Africa between 1800 and 1400 years BP (Vogel and Fuls 1999). Phytoliths recovered from one of the earliest occupied of such sites, Broederstroom, include wetland species of sedges and herbaceous grasses indicating wetter than present conditions (Huffman 1996). The immigrating Iron Age people were clearly

attracted to southern Africa because of its agricultural potential. Pulses of expansion of Iron Age agropastoralists into new niches in southern Africa generally correlates with wetter and warmer conditions than are presently found (Huffman 1996). The presence of the newcomers would have presented a source of resource competition for pastoral populations. However, the linguistic evidence indicates that Khoekhoe-speaking pastoralists remained in northern and northeastern South Africa for at least 1000 years after the arrival of Bantu-speaking populations (Ehret 2008).

Early Iron Age farmers who settled in southern Africa after 1800 years BP appear to have kept sheep, but there is only limited evidence for cattle and goat husbandry. Throughout the Iron Age, farming communities on the Zimbabwe Plateau grew increasingly invested in participating in the trans-Indian Ocean exchange networks, and their settlements were located near stone-walled enclosures that grew into loosely organized states. Between 1400 and 1000 years BP, the distribution of Bambata Ware and other thin-walled ceramics becomes increasingly restricted and thick-walled vessels associated with crop-raising/iron-producing communities is widely distributed throughout southern Africa (Sadr 2008a). Butchering cattle became increasingly important to these farming communities by the Late Iron Age (ca. 700–200 years BP), which has been attributed to the arrival of Nguni and Sotho-Tswana speakers from northeastern South Africa (Badenhorst 2010).

Successive waves of Bantu-speaking migrants into southern Africa during the Middle and Late Iron Ages (Hammond-Tooke 2004) as well as indigenous changes in niche fulfillment strategies resulted in a complex cultural mosaic at the time of European colonization. For at least the last 270,000 years, rainfall in eastern and southern Africa has been antiphasing, meaning that as rainfall decreased in eastern Africa, it was simultaneously increasing in southern Africa, and vice versa (Simon et al. 2015). Such climatic factors have catalyzed interregional migrations of agropastoral people throughout the late Holocene seeking good pasture and farmland. With the immigration of new populations into southern Africa, subsistence and settlement patterns of indigenous Khoekhoen changed – in some cases moving toward a foraging-intensive exploitation pattern (Wilmsen 1994) or, in other cases, they moved to a livestock-intensive exploitation pattern (Kinahan 1991).

Discussion of the Evidence

Neolithic pastoralists entering East Africa entered into new niches at the same time ecological conditions in their homelands were desiccating. It is likely that pastoralists entered the Ethiopian Highlands for the same reasons at approximately the same time, but they are less archaeologically visible than in Lake Turkana. Pastoralism took shallow roots south of Lake Turkana as a seemingly minor compliment to indigenous foraging systems. Marshall (2000) has suggested that raiding of herds may have been the mechanism in which livestock appear in new niches. In any event, the evidence is relatively clear that early pastoralism had little effect on indigenous settlement and subsistence practices. Livestock were incorporated as just one more resource within a broad-base subsistence regime.

Given the evidence for antiphasing climates between eastern and southern Africa in the late Holocene, livestock husbandry in southern Africa may have arisen from small populations of environmental refugees leaving East Africa around 2000 years ago and settling in the greener pastures of southern Africa (Scott et al. 2012). The low archaeological visibility of these migrants is typical of itinerant pastoralists, who tend to leave few traces on the landscape due to the fact that having copious amounts of material culture is antithetical to a mobile lifestyle (Shahack-Gross et al. 2003). As in the pioneer phases of livestock introgression in eastern Africa, some southern African foragers recognized the newcomers as bringing an innovation that could be useful if resources became scarce.

Changing environments and cultural practices in eastern and southern Africa during the late Holocene incubated livestock husbandry until it began to assume an ever-more important role in dictating settlement and subsistence practices. In the savanna plains and Rift Valley, there is strong evidence for the development of a "cattle-first"

economy after 3000 BP. However, there remained many foraging-first communities across eastern and southern Africa interacting with their agricultural and pastoral neighbors into modern times. From a cultural ecology perspective, the degree to which people relied on domesticated and wild resources will vary by geography and time, depending on the ability of different communities to feed themselves from the land or subsist through trade with their neighbors.

In East Africa, late Holocene economies of the Highlands and Coastal Plains continue to practice the broad-based subsistence regimes inherited from middle Holocene foraging-herders. Elmenteitan communities in the Highlands were vertically transhumant, but had a broad subsistence base. In the Coastal Plains and Lake Victoria region, pastoralists were tethered to resource-rich riparian areas, but little is known of how they lived in the immediate coastal hinterlands. Evidence from Galana River in southeastern Kenya and the Lower Rufiji River in Tanzania show that there are cultural connections to livestock-dependent pastoralists living in the interior, but the indigenous subsistence economy and lithic traditions remain constant throughout the Later Stone Age Neolithic period. A similar pattern is followed among Kansyore sites in the Lake Victoria region, albeit with varying degrees of integration of PN subsistence and tool production techniques (Prendergast 2010a). In these lacustrine and fluvial settings, domesticated animals were integrated into riparian foraging strategies, which included hunting, fishing, and collecting edible plants and invertebrates that grew in aggrading floodplains.

Immigration of Bantu-speaking populations who raised yams and millet and introduced iron production represented a new subsistence niche, which may have clashed with transhumant pastoralism. Until recently, most scholars believed that approximately at 2000 years BP, a unified Bantu cultural complex immigrated to the northern Lake Victoria region from western Africa bringing Urewe tradition ceramics, iron working and sedentary farming with them (Vansina 1995). However, well-dated archaeological data sets from Lake Victoria (Lane et al. 2007), archaeogenetics (Pickrell et al. 2014; Skoglund et al. 2017) and revised linguistic analyses (Ehret 1998) indicate that the introduction of these cultural features were asynchronous. Regardless, the overall effect of these new cultural features realigned subsistence practices in the region with some pastoral groups eschewing cultivation altogether, while others (particularly in the Lake Victoria Basin, Highlands and Coastal Plains of the Indian Ocean) adopted plant cultivation as yet another resource that could be utilized as needed.

The impact of agricultural/grazing practices and iron production significantly altered the distribution of woody and grassy taxa across eastern Africa after 5000 years BP. Burning and tree coppicing were intentional landscape management tools undertaken during the Neolithic across the African continent (Boivin et al. 2016). After 2000 years BP, significant shifts in the distribution of grasslands at the expense of primary-growth forests found in lakes all across the western Rift Valley are evidence of increasing proprietorship of land. Intensive management of patches of land would result in circumscription of territories that was not necessarily beneficial to unrestricted movement of transhumant pastoralists. In this case, the indigenous populations were forced to adopt aspects of the new economy, move to a new area, or attempt to maintain a transhumant pastoral lifestyle in an increasingly territorially-circumscribed landscape.

Some groups clearly remained rooted in the Neolithic pattern practicing transhumant pastoralism as evidenced by sites dating to after 3000 years BP on the Mara Plains and Laikipia Plateau of the Central Rift Valley and in the East African Highlands. It is likely that these pastoralists traded animal products and byproducts with their farmer/forager neighbors, but there were also likely clashes over access to land in which different cultural groups competed for resources. Such clashes were commonly documented in the ethnographic record beginning in the nineteenth century. Maa-speaking pastoralists frequently fought with Kikuyu and Luo groups in an attempt to gain pasture in the fertile Central Highlands and Lake Victoria Basin, respectively (Galaty 1993). During the nineteenth century, the highly fatal cattle

disease rinderpest had devastated Maasai herds and severely stressed intergroup relations in the form of rampant livestock raiding (Sobania 1993). A further climatic stress is also possible occurring during the end of the Little Ice Age (AD 1300–1850) in which wetter precipitation regimes gave way to much more arid conditions than had been witnessed in several 100 years (Verschuren 2001). A cultural antipathy developed amongst the Maa for their neighbors, and vice versa in which neither group viewed the others as humans (Berntsen 1979). Such a cultural proclivity is common amongst groups who compete for a common resource pool. For the purposes of the present discussion, it is significant to the extent that niche fulfillment under mutually symbiotic conditions can quickly be thrown off-balance when resource bases become strained.

The move of pastoralism across the Zambian and Zimbabwe plateaus into southeastern Africa was rapid and features of the Bantu expansion can be interpreted as a having immigrated as a "package." When viewed through the lens of John Alexander's (1980) and Paul Lane's (2004) analyses of Neolithic frontiers, the colonization of this broad area occurred so rapidly that the "settling in" phase of frontier expansion had little time to occur. In this sense, the moving frontiers of incipient East African pastoralism (ca. 4000–3000 years BP), eastern equatorial Africa (3000–2000 years BP) and southern African pastoralism (2000–1500 years BP) shared some common aspects (Sadr 2003). The initial spread of domesticated animals into eastern equatorial Africa between 4000 and 3000 years BP have many of the characteristics of Sadr's (2003) "foragers who herd." There is no evidence for radical changes in indigenous tool technologies, and hunting and gathering seems to persist in much the same way that it did before livestock were introduced (Dusseldorp 2016). After a period of incubation in the Turkana Basin, pastoral occupation of eastern equatorial Africa after 3000 years BP diversifies into a range of niche fulfillment specialists, which adapted further after the arrival of Bantu agro-pastoralists after 2000 years BP. Likewise, after incubating in eastern equatorial Africa from 3000 to 2000 years BP, the spread of pastoralism into southern Africa was initially limited, but diversified over time as niches filled and complex exchange networks evolved.

New demographic pressures faced after sedentary farmers circumscribed access to pasture lands encouraged some of these pastoral communities to look for new pastures elsewhere. The expansion southward represented the only possible route for expansion given the dense stands of rainforest located to the west, established and entrenched pastoral communities to the north and ocean to the east. By 1600 years BP, pastoralism had reached the southern tips of Africa, but the migrations left little obvious archaeological footprint on the landscape that would separate them from the indigenous economies. In this regard, despite genetic and linguistic evidence for a demic expansion of Khoekhoen at the same approximate time that small domestic stock begin appearing at a few sites in southern Africa, the overall subsistence economy remained weighted toward hunting and gathering for several 100 years until the arrival of the Bantu speaking agro-pastoralists. As in the East African case, the abundance of wild resources in the wetter-than-present southern Africa at around 2000 years BP provided many subsistence options, and keeping and culling numerous quantities of domesticated animals does not appear to have been culturally preferred.

Within 200 years of the initial appearance of livestock in southern Africa, farming communities expanded into the region. This migration further filled the ecological niches on the African subcontinent, so new relationships between pastoral, farming and foraging communities were forged. As Andrew Smith (1992) states, there were three choices left for indigenous hunter-gatherers who were in southern Africa as pastoralists filled their niches: (1) adopt a pastoral lifestyle themselves, (2) enter into a subservient patronage relationship with food producers, or (3) move into marginal environments and exploit lower-ranked resources. Based on the present-day archaeological evidence, it seems that there was a combination of all three factors amongst the populations of eastern and southern Africa between 2000 and 1600 years BP.

In many other regions of the world, the Neolithic was a transformative event in which agriculture permanently so radically changed the landscape that foraging was no longer possible. However, this was not the scenario in eastern and southern Africa. The subsistence practices of individual communities were and remain fluid to this day. Many! Kung of the Central Namib Desert have shifted between foraging-and pastoral-dependent economic strategies for hundreds of years (Kinahan 1991). Domesticated animals in eastern and southern Africa represented just one more subsistence choice in a quiver holding many arrows.

Conclusion

The eastern and southern African Neolithic is diverse and has evolved throughout the Holocene to incorporate many different subsistence and settlement practices. Early pastoral communities in eastern Africa from 5000 to 3000 BP had broad-based subsistence strategies and remained tethered to localized resource bases. After 3000 BP, pastoralists on the grassland plateaus and Rift Valley were seasonally mobile and appear to have restricted their diets to meat, animal byproducts and probably other foods, which do not leave traces in the archaeological record. Pastoralists living in the East African Highlands and Coastal Plains of the Indian Ocean continued to subsist on a wide array of wild products, and continued to use domesticated animals as a secondary food source.

Experimentation with small-scale horticulture is possible prior to the emergence of intensive yam and millet cultivation after 2000 BP. It is likely that demographic pressures placed restricted access on transhumance after sedentary farming took hold in the fertile regions of East Africa. Mobile pastoralists chose to migrate south into the Zimbabwe Plateau, Miombo Woodlands, Mozambiquan Coastal Plains and southern African Highveld, filling most of the viable pastoral niches within 400 years subsequent to leaving East Africa. The archaeological invisibility of the Neolithic (Khoekhoen) herders suggests that the pastoralists who entered southern Africa were highly mobile—carrying only the bare essentials, which would have left a small footprint on the landscape. The southern African Neolithic manifested in the form of foragers who kept some domesticated animals, and, as Bantu Iron Age agropastoralists entered the region, limited plant cultivation was practiced as well.

The beginning of the Iron Age in southern Africa after 2000 years BP reconfigured niche fulfillments and subsistence choices, but the ethnic legacies of these migrations endure genetically and linguistically into the present day. The persistence of foraging and herding subsistence strategies across eastern and southern Africa into modern times as well as the continued use of stone tools despite the presence of metal technologies attests to the success of these adaptations in these settings. To this extent, the end of the Neolithic is diffuse and cannot be ascribed on the basis of the beginning of the Iron Age. Iron Age and Neolithic lifeways were operating in tandem throughout the late Holocene with people shifting subsistence strategies regularly, entering into new exchange relationships or fighting for land with other communities based on what they needed to do to survive that particular year. This legacy persists to the present day as flexible modes of subsistence remain critical aspects of modern farming systems in Africa.

Cross-References

- ▶ Agriculture: Definition and Overview
- ▶ Animal Domestication and Pastoralism: Socio-Environmental Contexts
- ▶ Asses/Donkeys: Domestication
- ▶ Cattle: Domestication and Development
- ▶ Cognitive Evolution and Origins of Language and Speech
- ▶ Domestication: Definition and Overview
- ▶ Genetics of Animal Domestication: Recent Advances
- ▶ Genetics of Early Plant Domestication: DNA and aDNA
- ▶ Goat: Domestication
- ▶ Nabta Playa: Agriculture and Domestication

- ▶ North and Saharan Africa: Geography and Chronology
- ▶ Southern Africa: Origins and Development of Agriculture
- ▶ Southern and East African Middle Stone Age: Geography and Culture
- ▶ West and Central African Neolithic: Geography and Overview

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East Asia: Early *Homo* Fossil Records

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Introduction

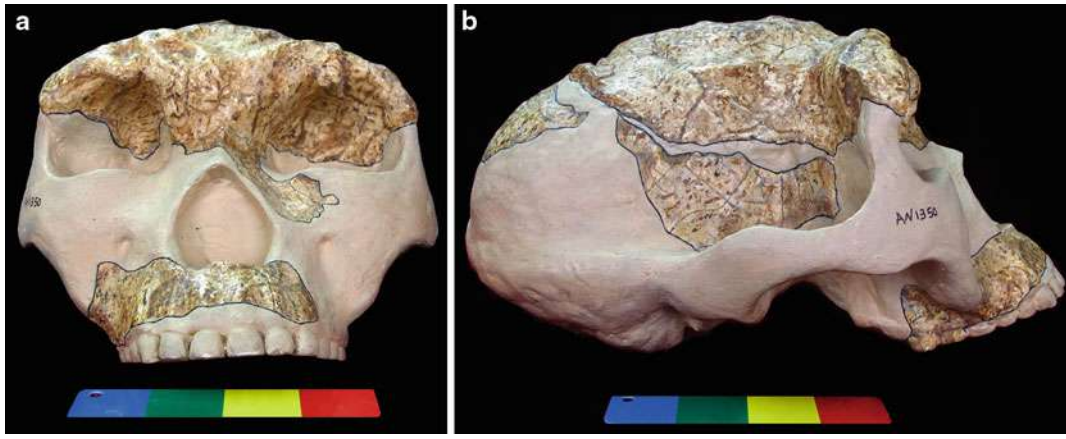
Early *Homo* fossil records of East Asia are attributed to those within the Early Pleistocene, represented by the following specimens found in China only. Those are identified as Asian *Homo erectus*; thus, their physical characteristics and geocultural context are described below.

Key Issues/Current Debates/Examples

Yuanmou

The human fossils were found in 1965 in brown clay of fluvial deposits between Shangnabang and Danawu Villages, Yuanmou County, Yunnan Province, in southwestern China. The fossils are represented by left and right upper median incisors. The incisors are large, indicative of a male individual. The teeth are moderately worn (Fig. 1a, b). The crown is rather thick and swollen. On the upper part of the lingual surface, there is a prominent basal tubercle. Three fingerlike processes diverge from the lower margin of this tubercle. The middle process is the thickest and longest of the three; it extends almost to the biting edge of the crown. Prominent ridges appear along the medial and lateral borders of the lingual

East Asia: Early *Homo* Fossil Records, Fig. 1 Two Homo erectus teeth of Yuanmou (**a**) back view and (**b**) frontal view



East Asia: Early *Homo* Fossil Records, Fig. 2 Gongwangling cranial reconstructions (**a**) frontal view and (**b**) side view

surface of the crown. The lateral one is more prominent. The lower part of the root of left incisor was preserved. Its cross section is ellipsoid and slightly flattened anteroposteriorly. The site has yielded mammalian fossils of Early Pleistocene. The paleomagnetic date of the stratum yielding the human fossils is around 1.7 mya. The ESR date recommended by the chronologists is earlier than 1.1 mya and later than 1.6 mya.

Gongwangling

Homo fossils were found in 1964 and include a few cranial fragments based on which Wu Rukang made a reconstruction. The fossils are embedded in light yellow loess-like silty clay with many concretions at north slope of a hill named Gongwangling near Gongwang Village, about 17 km east of Lantian City, Shaanxi Province, Central China. The supraorbital torus is very robust. Its medial part is thicker than the lateral part (Fig. 2a, b). Trace of frontal notch exists on each side. The glabella region is very robust. The postorbital constriction is much exaggerated. There is no posttoral groove; this is similar to that from Trinil, Java. Trace of midsagittal ridge and bregmatic eminence could be seen on the eroded external surface of frontal. X-ray shows no frontal sinus. Temporal line appears as a prominent ridge. Both anterior and posterior surfaces of the pyramid are steeper than that in *H. erectus*

from Zhoukoudian; the upper border of the pyramid is more acute than the latter. The arcuate eminence of Gongwangling temporal is more similar to that in modern humans than to Zhoukoudian *H. erectus*. A small facet on the posterior surface of the pyramid lateral to the internal auditory meatus is more similar to the latter specimen than to modern humans. Frontonasal and frontomaxillary sutures of both sides form a slightly curved line. The central part of this line is slightly convex upward. The upper part of nasal bones is broader than that of modern humans. The nasal saddle is flatter than that in modern Mongoloids. Nasion region is not depressed. The orbital roof is flat. The median sagittal contour of maxilla is convex as in modern apes and shows alveolar prognathism. This contour forms almost a right angle with the floor of nasal cavity, with an obvious demarcation in between. A small but distinct anterior nasal spine exists clearly. A fairly marked canine jugum could be seen on right maxilla. The lower border of the zygomatic process of maxilla is not curved. The point where it joins the maxillary body is close to alveolar border. Exposed maxillary sinus extends between the levels of the canine and the anterior surface of third molar. Its medial border corresponds to the lateral border of the palate instead of protruding into the palatal process of maxilla.

The right third upper molar has much smaller crown length than that of second one. Its occlusal surface is nearly triangular. The root of this molar has three branches as shown in second upper molar, but the bifurcation angle between the buccal and lingual branches is smaller than that of the upper second molar. The length between the point of bifurcation and the neckline is shorter in the root of third upper molar than that in the second one. The size and attrition of teeth and condition of sutures suggest the individual belonging to a female around 30 years old.

A few artifacts have been found at the site. Paleomagnetic date is 1.15 mya or 800–750 ka. Associated mammalian fauna corresponds to that of Early Pleistocene and included tropical and subtropical species, indicating that the environment was warmer than today.

Quyuanhekou Yunxian

Human fossils were found on a small hill named Xuetang Liangzi at the mouth of Quyuan River near Mituosi Village of Yunxian County, Hubei Province, Central China. Different names affiliated with these fossils have been once used in various articles. Two human crania had been heavily deformed and damaged in certain degree by pressing in the stratum of grayish yellow clay layer and/or grayish white sand layer of the fourth terrace of Hanjiang River. Judging from the closure of sutures both skulls may represent middle-aged individuals.

Skull EV9001

The vault is low and flat with receding frontal. The supraorbital tori are thick. There is trace of metopic suture on the glabellar torus. The supraorbital groove is shallow and wide. There is no distinct median sagittal ridge. Postorbital constriction is obvious. There is an occipital torus. The superior temporal line of the left side is distinct. The preserved part of the root of the mastoid process suggests a large mastoid process. The tympanic plate is concave; its long axis is transversely oriented. The mandibular fossa is deep. The nasion is deeply indented below the glabella. The orbit is quadrangular with the inferolateral margin somewhat blunt. The anterolateral surface of the sphenofrontal process of zygomatic bone faces more forward. The lower border of the zygomatic process of maxilla is curved. The point where it joins the maxillary body is above the point between the first and second molars, with a long distance from the alveolar margin. Reconstructed zygomatic arch is below the level of Frankfurt plane. A buccal exostosis exists between the positions corresponding to first and second molars. There is no canine jugum. The midsagittal contour of the anterior surface of the alveolar process is convex. The palatal vault is much longer and deeper than that in modern humans. Large part of the dental arch is preserved; it is close to U shape. The teeth are robust especially for the buccolingual diameter. The size of the molars increases from anterior to posterior. The contour of the occlusal surface of left third molar is nearly pear-shaped. A large cusp exists at the distobuccal part of the crown.

Skull EV9002

Top view of this cranium is ovoid with an obvious postorbital constriction. The glabellar torus is slightly depressed and with trace of a metopic suture. The supratoral groove is distinct and the frontal squama is flat. Parietal tuberosities of both sides are distinct. An atypical angular torus seems to be present. The superior and anterior margins of the temporal squama are curved and straight, respectively. The parietal notch between the squamosal and mastoid portions of the temporal is rather deep. The external auditory orifice is deeply located; the distance from it to the sagittal plane passing the auriculare is 17.2 mm on the left side which is deeper than those in *Homo erectus* specimens from Hexian and Zhoukoudian. The mastoid process is large. The mandibular fossa is wide and shallow. The postglenoid process is low. The tympanic plate is thick and concave; its long axis is oriented in transverse direction. The angle formed by this axis and the sagittal plane is much larger than that in modern humans. The occipital torus is well developed, with the central part thicker, and attenuates toward both lateral ends. It fails to continue with the supramastoid crest. The torus marks an angular turn from the occipital to nuchal plane of the occipital bone. A short and distinct supratoral groove exists above the central part of the occipital torus. Orbit is rectangular with rounded angles. The inferolateral margin of the left orbit is blunt instead of being sharp. Infraorbital foramen of both sides is distinct. Reconstructed pyriform aperture is higher and narrower than that of Skull EV9001. The root of the zygomatic process of the maxilla is highly located. The canine fossa is shallow. A prominent canine jugum exists in the right side. There are buccal exostoses at the position corresponding to M2 and P2 on left and right sides, respectively. A lingual exostosis exists at the position corresponding to right M1–M2. The palatal vault is much longer and deeper than that in modern humans. There is a palatine torus and a deep palatine sulcus as well as an anterior palatine foramen. The dental arch is close to a parabolic curve. The dentition is incomplete, but all preserved teeth are in their original position. The second molar is obviously larger than the first one. The crown of left third molar is very small and was worn with exposure of the dentine. The thickness of the vault is close to that of *Homo erectus* from Zhoukoudian.

The human fossils are in association with a lot of mammalian fossils of Early Pleistocene and stone artifacts. The site was dated by Paleomagnetism to 870–830 ka and by ESR date on the mammalian fossils to 565 ka.

Meipu, Yunxian

Human left upper incisor, found at Meipu of Yunxian County, Central China, is almost complete and slightly worn. It is shovel-shaped, with a prominent basal tubercle and fingerlike process not well developed near the cutting edge. The length of the crown is close to the average for *Homo erectus* from Zhoukoudian. The left lower incisor is heavily worn. There is the basal tubercle appearing as a smooth eminence. The cervix is not constricted. The left upper second premolar is complete and slightly worn; the root is lost. The buccal half of the crown is slightly wider than the lingual half. The buccal cusp is larger and higher than the lingual one. A trace of the cingulum appears as a triangular eminence at the basal part of the buccal surface and as two small ridges on both sides. The left upper first molar is rather complete and slightly worn. The distolingual angle is more rounded than the mesiobuccal one. The protocone and paracone are slightly higher than the distal two cusps. The protocone is the largest cusp, and the hypocone is the smallest. Each cusp possesses several fine ridges. There is no Carabelli cusp, but there is a very small fovea on the lingual surface near the marginal ridge. A trace of a cingulum can be discerned. The lingual branch of the root does not bifurcate. A longitudinal deep groove exists toward the middle of the lingual surface. The buccal branches are lost.

From the deposits transported by the farmers from the cave to the outside, a pebble nucleus showing traces of striking by a stone hammer has been reported. Associated mammalian fossils belong to *Ailuropoda-Stegodon* fauna, probably of Early Pleistocene.

Jianshi

The human fossils, recovered from the excavation of Longgudong Cave, near Gaoping Town, Jianshi

County of Hubei Province, are identified as three lower (second?) molars found in 1970 and a premolar, an upper molar, and a lower molar in 1999–2000. Besides, a right first lower molar was found from a drug store of Badong City about 42 km northeast of the Longgudong site in 1968. Two of the three molars found in 1970 are from right side; one is from left. Occlusal surface of one specimen is elliptical; two are nearly quadrangular. Well-developed protoconid cingula exist in two specimens; that in another molar is less developed. All three molars have tuberculum sextum, which deviates slightly to the lingual side from the median line of the occlusal surface in two of them; this small cusp locates on the median line in another specimen. Main furrows on occlusal surface of two molars arrange in a reverse T pattern instead of a Y or plus pattern. The following three teeth are found in 1999–2000 excavations:

PA1278

Right upper first premolar is complete and has two roots. The mesiodistal and buccolingual diameters are within the range of those in *Homo erectus* from Zhoukoudian and *Australopithecus africanus*. But the length-breadth index and morphological details are different from those in the latter. There is no cingulum and molar tubercle. It is considered that this premolar is close to S-4 from Java in morphology, but slightly longer in mesiodistal diameter.

PA1279

Left upper third molar is complete and much worn. The occlusal surface is nearly square. A cingulum exists at buccal and mesial surfaces. The three branches of the root do not show inclination toward combination. The mesiodistal and buccolingual diameters are much larger than that of *Homo erectus* from Zhoukoudian and larger than that of specimens S-17 and S-4 from Java; it is within the range of *Homo habilis* in these diameters, but is different from the latter in morphology. Longgudong specimen is within the range of *Australopithecus* in size and length-breadth index, but is different from the latter in morphology.

PA1277

Right lower first molar is well preserved and much worn. A cingulum exists on the buccal surface. The root has two branches. Mesial branch has two tips; distal branch has only one tip. The size and length-breadth index of the crown is well within the range of *Homo erectus* from Zhoukoudian, *Australopithecus africanus*, *and A. robustus*. Size of Longgudong specimen is close to *Meganthropus* (S-6).

The lower molar collected from the drug store has protoconid cingulum on buccal surface. The furrows on occlusal surface arrange as a "plus pattern". A small cusp corresponding to tuberculum sextum appears in the middle of distal margin.

Guojiabao

This site is about 250 m south of Shangnabang Yuanmou site (see above). The human fossil is a fragment of mid-shaft of the tibia. This fragment is 227 mm long and rather gracile, without any robust ridges. At what is assumed to be the middle point of the shaft, the circumference, transverse, and longest sagittal diameters are 78 mm, 17 mm, and 29 mm, respectively. The bone wall is thick. The anterior border of the fragment is rounded at the upper part and becomes thinner at the middle part and more rounded at the lower segment. The S-shaped curve of the anterior border is weaker than that in modern humans. Reconstructed stature of this individual is 130.4–123.6 cm. The provenance of this fragment is in doubt. It was first described as being found in the bottom layer of slope materials which include deep brown silty clay and stones of different size. These overlie a layer of brownish-red silty clay. However, the tibia was later described as coming from the superficial part of the brownish-red silty clay layer. The slope material was estimated to be correlated with the 26th layer of fourth member of the Yuanmou Formation, so to consider the tibia to be in the late Early Pleistocene, and in excess of 1 mya.

Cross-References

- ▶ East Asia: Paleolithic
- ▶ *Homo erectus*
- ▶ Wu, Rukang
- ▶ Yuanmou
- ▶ Zhoukoudian, Archaeology of

Further Reading

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East Asia: Paleolithic

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Introduction

East Asia conventionally refers to the countries of China, Japan, and Korea; but in a broad geocultural sense, the region includes all types of landscapes in today's Mainland China, Mongolia, islands of Taiwan, Japanese Archipelago, Korean Peninsula and its associate islands, as well as the Russian Far East in the north end and the northern part of Indochina Peninsula in the south end.

Our current understanding of the Paleolithic in East Asia has been based on isolated fossils and lithic data separately from China, Japan, and Korea. Until recently primary interpretations of Paleolithic technology and hominid behaviors have been built upon Chinese data with some from Japanese materials. Only during the last decade have collaborative efforts been made to consolidate the data from the three countries plus Russia via the annual meetings of the Asian Palaeolithic Association (APA) and their proceedings; however, only few thematic syntheses in East Asia have been available in Western literature. This introduction is an update on the current research progress in this region, with focus on lithic technological comparisons across these countries. We will try not to place heavy emphasis on Chinese materials, as studies of such are available in recent publications (Shen 2007, 2011). By no means is this introduction meant to present a comprehensive view of Paleolithic research in these three countries during the past decades; however, we will provide balanced interpretations and overviews of current issues and debates in Paleolithic cultures within the entire region.

Definition

In general the lithic industries of the East Asian Paleolithic, represented by accumulated data from thousands of sites, do not present their regional and temporal variations as much as those in the west side of the Old World. Only after roughly 40,000 years ago, dramatic changes occurred, and lithic technologies became diversified and complicated when modern humans occupied most landscapes of East Asian including the Japanese Archipelago. Therefore, many East Asian scholars have abandoned the three divisions of Paleolithic – Early, Middle, and Late – that are commonly used in other regions. Instead two divisions of both Early Paleolithic and Late Paleolithic were proposed to uniquely represent the technological development of East Asian lithic industries during an approximate 1.7 Ma time span (e.g., Gao and Norton 2002). In some publications, the defined "Middle Paleolithic" sites, which are few and mostly in China, are clearly indistinctive from those of the Early Paleolithic in terms of raw material procurement, core reduction, tool blanks, retouch techniques, etc. The transition to Late Paleolithic around 50,000–40,000 BP is obvious in Mainland China, but natures of such transition were still unclear due to a lack of solid data and

sites during this time frame. The fact is that after 40,000 BP, a dramatic increase of Late Paleolithic occupations occurred in both Japan Archipelago and the Korean Peninsula. The emergence of modern humans and their associated behaviors may be largely attributed to these cross-ocean migrations in East Asia.

In most cases, a common way to place Paleolithic lithic industries in East Asia into a time frame is to refer to their distinctive geological chronology. The unique East Asian loess stratigraphic formations can reliably place dates of a site or sites into Lower, Middle, and Upper Pleistocene brackets in the mainland, verified with various absolute dating methods for remote ages. Japanese sites were referred temporally with sequences of marine isotope stage (MIS) as well as tephra-stratigraphy.

Loess is a very fine-grained silt or clay, created from grinding by glaciers, that accumulate in layers of distinctive colors and textures evenly spread out across the landscape. These layers are deposited by winds during different Pleistocene epochs from areas of land covered by glaciers and from desert surfaces. They are quite unique and therefore can form the references to geological time frames for East Asian Paleolithic sites.

Marin isotope stage (MIS), or oxygen isotope stage (OIS), is a timescale sequence deduced from oxygen isotope data from coring samples from deep sea, which would reflect changes in temperatures – dividing periods of alternating warm and cool periods of the Earth paleoclimate. The MIS timescale, starting backward from MIS 1 and representing between the present time and 11,000 BP, was developed to mark the dating in the quaternary period (around 2.6 million), which would give a relatively fine scale with each epoch of Pleistocene period when Paleolithic sites were identified.

Tephra, unique to Japanese Archipelago but also having an impact on coastal lines of the continent, is a layer of air-fall materials produced by a volcanic eruption, events of which can set an absolute time indicator for sites beneath or above the layer. One of the most famous Japanese tephra – Aira-Tanzawa, resulting from a massive eruption that occurred between 26,000 and 29,000 BP at the island of Kyushu – has become the reliable time marker for dating Late Paleolithic sites in East Asia.

Early Paleolithic refers to cultural remains of archaeological sites falling within periods between the Lower Pleistocene to the Early Upper Pleistocene, or timescale MIS 62–MIS 3, from c. 1.7 Ma ago to 40,000 BP. The Early Paleolithic of East Asia is primarily represented by lithic industries in China, which consists of pebble-core tools from South China and flake tools from North China (Shen 2007). A few sites of the Middle Pleistocene yielded Acheulean-type large cutting tools (e.g., hand axe) or biface tools both in China and in Korea (see below). In China, approximately a thousand sites of the Early Paleolithic are recorded, spreading out temporally through the Lower Pleistocene (65), Middle Pleistocene (655), and Early Upper Pleistocene (230) (Xu 2012). Only a handful of assemblages of Early Paleolithic sites in Korea and Japanese are dated to the Middle Pleistocene. Pebble-core tools and flake tools were homogenously predominant in this period.

Late Paleolithic refers to cultural reminds of archaeological sites roughly dated younger than 50,000 years ago in China, slightly later in time for those assemblages in Korea and even younger in Japan. The sites are associated with modern human occupations and migrations representing a variety of new lithic technologies on the continent, which include blade technology, bifacial technology, and microblade technology (Shen 2011). Numbers of Late Upper Pleistocene sites in China increased to near one thousand. Over 5000 Late Paleolithic assemblages are registered in Japan and more than 100 known sites in Korea (Ikawa-Smith 2007; Bae 2010a). Japanese Late Paleolithic can be further divided into Late Paleolithic I (35,000–28,000 BP), Late Paleolithic II (28,000–20,000 BP), and Late Paleolithic III (younger than 20,000 BP).

Historical Background

When Eugene Dubois (1858–1940) discovered a skull fossil in 1891 on the banks of the Solo River

in East Java, Indonesia, one of the first known specimens of *Homo erectus*, academic world had turned their interests to East Asia searching for fossils of remote linkages to modern human beings. Shortly after another famous skull fossil of the Peking Man (*Homo erectus or Sinanthropus pekinensis*) was found in 1929 by Davidson Black and his team at Zhoukoudian (aka Choukoutien). Following the discovery of the Shuidonggou and Salawusu sites in Northwest China, the lithic industry at Zhoukoudian was recognized by Henri Breuil (1877–1961) in 1931. The continuous excavation at Zhoukoudian in the subsequent years until 1937 yielded one of the richest lithic assemblages in East Asia. The early knowledge about the East Asian Paleolithic based on the "Peking Man" site was disseminated among students and scholars in Western universities. Hallam Movius (1907–1987) from Harvard was the first scholar who attempted a comparison between East Asian and European Paleolithic lithic technologies and later proposed the famous "Movius Line" in the 1940s, which is still an influential theory in the study of East Asian Paleolithic today (see the entries on Movius Line and Movius, Jr., Hallam L. in this encyclopedia).

While newly excavated Paleolithic data from China was not accessible to scholars outside of China until the mid-1980s, the search for Paleolithic culture in Japan started in 1949, when the Iwajuku site (about 90 km north of Tokyo) was excavated. The accumulation of Paleolithic data increased rapidly: nearly 100 sites were identified in 10 years after the discovery of Iwajuku and jumped up over 5,000 sites in the archipelago over half a century. There was a series of reports in 1970s–1990s on the discoveries of Japanese Early Paleolithic sites in Japan, which turned out to be a scandal of human falsehood. It is in general agreement among Japanese scholars that reports on these Early Paleolithic sites in publications should be dismissed, except those identified prior to 1973 should be counted for.

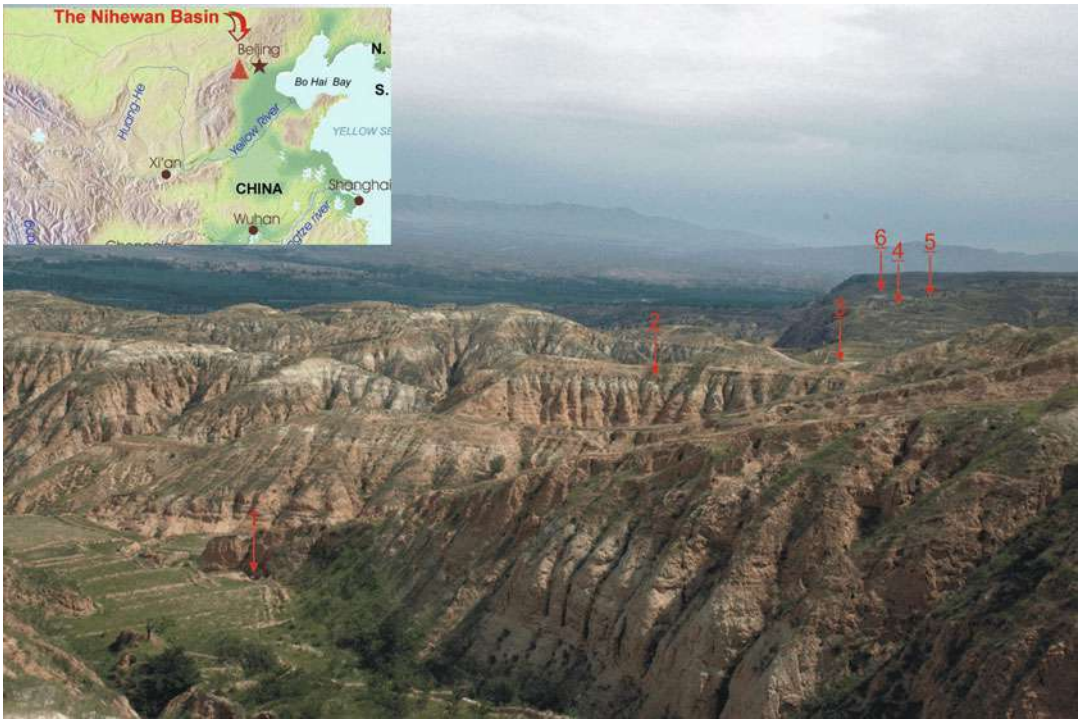
Similar to what happened in China between the 1950s–1980s, Paleolithic data from North Korea is very limited and incomplete. The first Paleolithic site was excavated at Donggwanjin along the Duman River during 1933–1935, and only 12 Paleolithic sites including those in North Korea were reported before the 1960s. Today, there are about 200 Paleolithic sites throughout the Korean Peninsula, but only 30 sites are being systematically investigated (Choi 2004).

During the past three decades, thousands of Paleolithic sites and assemblages have been identified in the countries of China, Japan, and Korea and placed within the Pleistocene time frame based on Loess formation sequences or marine isotope stage, separately according to their own paradigms (e.g., Wu and Oslen 1985). Except Japan, whose data were made well known in Western languages in earlier days, only recently the accumulated and integrated data from China, Japan, and Korea have been summarized and interpreted in English or other foreign languages (Shen and Keates 2003; Kuzmin et al. 2007; Shen 2007, 2011; Norton and Braun 2010).

Key Issues/Current Debates

Earliest Hominid Occupations and Migrations

The earliest hominid occupations in East Asian are known to be Nihewan in northern China. Nihewan is referred to here as a cluster of Early Pleistocene lithic industries represented by flake tools, which were located in the Nihewan Basin, Hubei province (Fig. 1). Over three decades of investigations, sites such as Goudi (aka Majuangou III), Xiaochangliang, and Donggutuo, among more than a dozen of others, all within 2 km radiation, yielded rich lithic assemblages and fossil remains embedded with the Early Pleistocene loess stratified formations in the Basin. Unfortunately no hominid fossils have been found yet. The analyses of lithic refitting and lithic use-wear demonstrate clear evidence of hominid behaviors involving procurement and modification of local raw materials (Gao et al. 2005; Shen et al. 2010). The Goudi site was dated to 1.7–1.6 mya by the paleomagnetic method, and recent investigation could reveal even earlier Nihewan sites such as Hetugou. It remains a strong interest to find paleobiological evidences to suggest who (*Homo habilis, Homo erectus*, or *unknown?*) were the creators of the Nihewan industries and how they arrived in East Asia.



East Asia: Paleolithic, Fig. 1 The Nihewan Basin of North China showing some of Early Pleistocene sites. 1. Hetugou, 2. Dachangliang, 3. Xiaochangliang, 4. Putaoyuan, 5. Madigou, 6. Feiliang

It should be noted that other locations in South China have yielded *Homo erectus* fossils from the Early Pleistocene, such as Yuanmou, Gongwangling, Quyuankekou, and Meipu. Yuanmou *Homo erectus* are regarded as the earliest fossil record in East Asia, with paleomagnetic dates pointing to as early as 1.7 mya. However, the dates associated with the teeth discovered in 1965 are weak in connection with hominid behavioral evidence, as their original context was not clear when the teeth were removed. There are similar debates on the discovery of Renzidong in South China and Xihoudu in North China, both dated to the range of 2.0–1.7 mya, but the natures of lithic assemblages are not accepted as hominid modification; thus, their roles to be one of the earliest hominid occupations paralleling to those sites in the Nihewan Basin are still under debate (Shen 2011).

One of the earliest well-known sites in Korea is Chongokni (aka Jeongikri), dated to 350–300 kya. Recent studies suggest that other sites such as Komunmoru, Sokchangni, and Keum cave could be earlier than Chongokni; thus, it may push back the first appearance of hominid occupations as early as 400 kya in the Peninsula (Bae 2010b). The natures of site formation and cultural context of the latter sites are still poorly understood, leaving Chongokni lithic assemblages to be the best representation of Middle Pleistocene occupations so far. The Chongokni industry is dominated by flake-core assemblages with presences of Acheulean-like hand axe. Early hominid fossils, including molars and incomplete fragments of skulls, come from Dokchon, Daehyundong in Pyongyang, and Ryonggok cave. Researchers tend to assign these Middle-to-Upper Pleistocene fossils into the category of archaic form of *Homo sapiens*, but cannot be confirmed before more substantial fossils come to light.

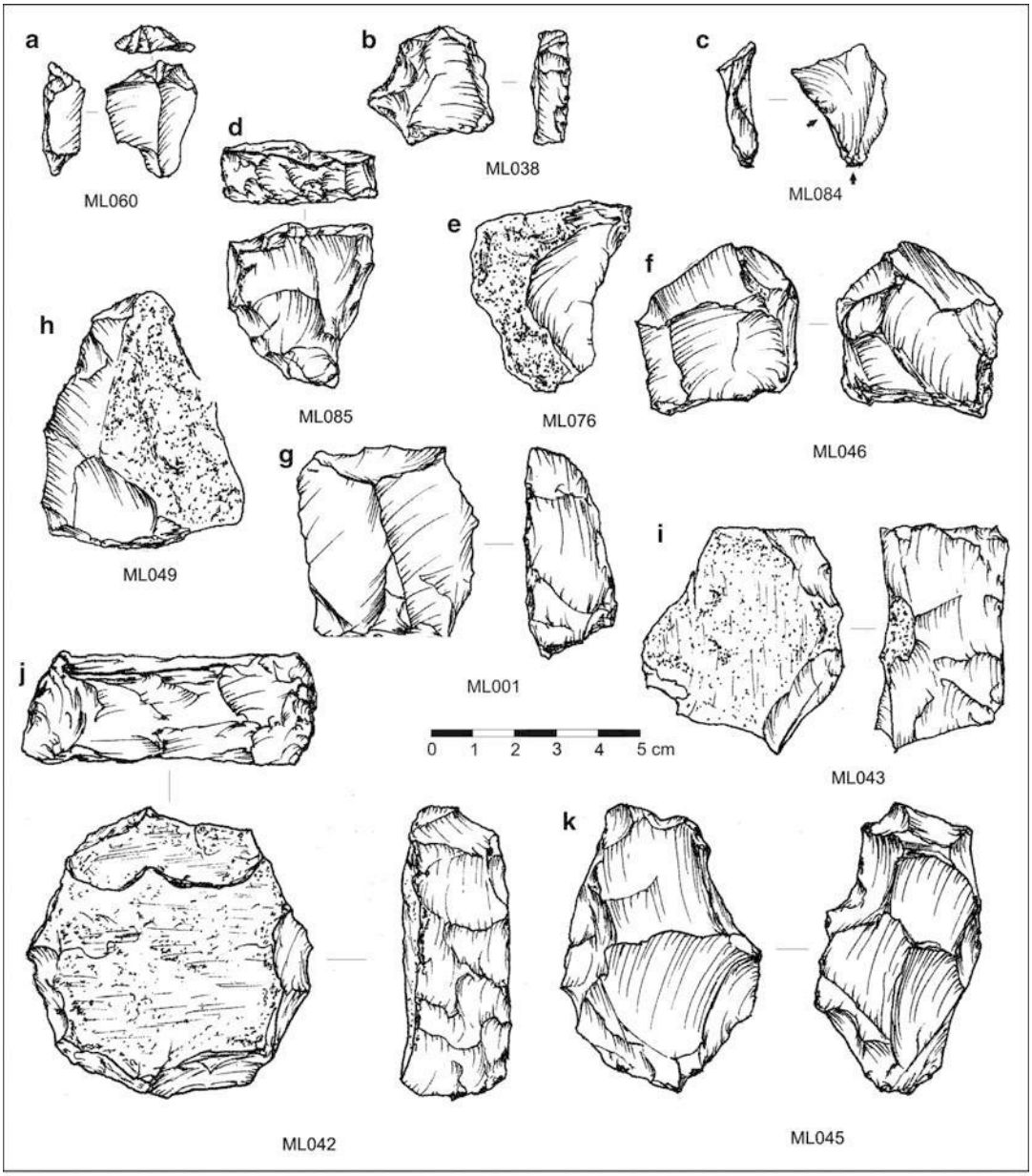
The earliest hominid occupations appeared in Japanese Archipelago much later, around the Middle Upper Pleistocene. No hominid fossil older than 35 kya were identified. The majority

of hominid fossils are found in the islands of Ryukyu, but without the association of stone tools. The Ryukyu fossils are identified as modern human forms of *Homo sapiens sapiens*, dated within the range of 33,000–14,000 BP (Matsufuji 2010). The oldest stone industry in Japan so far is known from Layer IV of Kanedori, dated to 80 kya by tephrochronology, one of the most reliable methods in Paleolithic archaeology. The Kanedori IV lithic industry was represented by large flakes with irregular bifaces, which are superimposed by small flakes and large bifaces of Kanedori III dated to 67 kya. Matsufuji argued that, even though the dates of the oldest Japanese occupations known so far fall within MIS 5 (127–71 kya), there is no evidence that the hominids could have had the capacity of ocean-crossings during this warm period. Instead, he suggests that East Asian hominids would have migrated to Japanese islands through the last land bridge during MIS 6 (186–127 kya), implying even older hominids evidence is yet to be found. A common use of hornfels for making flake tools, similar to that at Kanedori IV, was found at Xianrendong in Northeast China's Jilin province, adjacent to the Korean Peninsula. The uranium-series date of Xianrendong is 160 kya, which suggests the possibility for Northeast China origins of Kanedori IV occupations.

Flake Tools Versus Pebble-Core Tools

The prolonged periods of Early Paleolithic in East Asia are represented by two main lithic technologies as evidence of hominid's adaptive behaviors: flake tools in northern and southwestern China and pebble-core tools in southern China. As previously mentioned few Early Paleolithic sites are present in Japan and Korea; however, their technological presences are also either flake tool industries or pebble-core tools or a combination of both industries. Flake tools were produced by direct percussion or bipolar percussion through amorphous core reduction, no standard core platform preparation has been detected so far. Predominant flake blanks were modified into scrapers, notches, and burins. Raw materials mainly consisted of poor-quality quartz and quartzite, which were common locally available resources. Good-quality cherts were also selected during the later period at some sites. One of the most important Middle Pleistocene sites is the Zhoukoudian Locality 1 cave near Beijing. Studies of the lithic industries at Zhoukoudian Locality 1 and Early Upper Pleistocene Locality 15 demonstrate systematic strategy in the making and use of flake tools. Gao (2000) noted that the majority of tool types are scrapers of different types, including the straight sidescraper, convex sidescraper, concave sidescraper, end scrapers, thumbnail scraper, double-edged scrapers, and multi-edged scraper, which all together account for 93% of the 1,283 total tool assemblage. Although in general the tool kits are similar to those found at Locality 1, retouched tools at Locality 15 are more elaborate. Some specimens exhibit well-controlled fine retouch. At Nihewan, making and use of flake tools continued from that of the Lower Pleistocene sites in the region. A study of Maliang lithic artifacts, recovered from 1984 excavation season, suggests that Maliang hominids had developed more skilful tool-making capacities than their predecessors, for example, the increased sophistication of multidirectional core reduction. Flake tools were modified into standard shapes of scrapers and noteches, not seen in other earlier assemblages (Fig. 2). Use-wear analysis indicates that tools used at Maliang probably emphasized bone scraping/shaving functions (Fig. 3) (Shen and Wei 2004). Fine-made flake tools were employed continuously into the terminal Pleistocene period in North China.

Pebble-core tools were made bifacially or unifacially on cores or on large flakes attached from nodules, often found by riverbeds. The pebble-core tool industries in East Asia continued in most of southern regions throughout the Pleistocene until the end of Last Glacial Maximum (LGM) around 20,000 BP. The tool types include large cutting implements – like choppers, large points, or other heavy-duty tools (e.g., spheroids). The earliest known pebble-core tool industry is from Quyuanheko in Yunxian country of the Middle Changjiang (aka Yangtze) river valley, dated to 1.2–1.1 million ago (Fig. 4). One of the best examples of the pebble-core industry in the later Upper Pleistocene is the Jigongshan site, where the trend of pebble-core tools being replaced by flake tools was present. During the Upper



East Asia: Paleolithic, Fig. 2 Lithic artifacts recovered from the Maliang site, representing the flake tool industries at the Nihewan Basin, North China

Pleistocene, sites in the middle of the Changjiang Valley had a clear shift from predominantly pebble-core tools to flake tools. This could be an implication of possible cultural interactions or a southward movement from the north populations with flake tool traditions. A similar line of evidences was also found in Zhijidong near Zhengzhou City, during 50,000–35,000 BP. The shift may also be related to the dreadful cold and dry climate change in North China.

East Asia: Paleolithic, Fig. 3 Flake tools with evidence of use-wears from Maliang site, the Nihewan Basin. (**a**) ML085,14x. heavily rounded edge with use polish along the working edge, scatted scars are moderate to large in size with stepped and hinged termination, unifacially distributed on the dorsal surface. The wear type is indicative of scarping hard bone. (**b**) ML001, 28x. moderate to large scars bifacially distributed along the edgeof 10–15 mm. Scars are directional but most are vertical to the edge, heavy rounding and rare polish. Interpreted as cutting/sawing hard bones use-wear. (**c**) ML060, dorsal side, 56x. small to moderator sized feathered or hinged scars, unifacially distributed along the edge on dorsal side. (**d**) ML060, ventral side, 28x. heavy rounding and polish along ventral sided working edge (as opposite to that in previous photo). A few striation parallel or perpendicular to the edge are noted. The combination of wear patterns are suggestive of scarping wood use-wear

Industries of Hand Axes

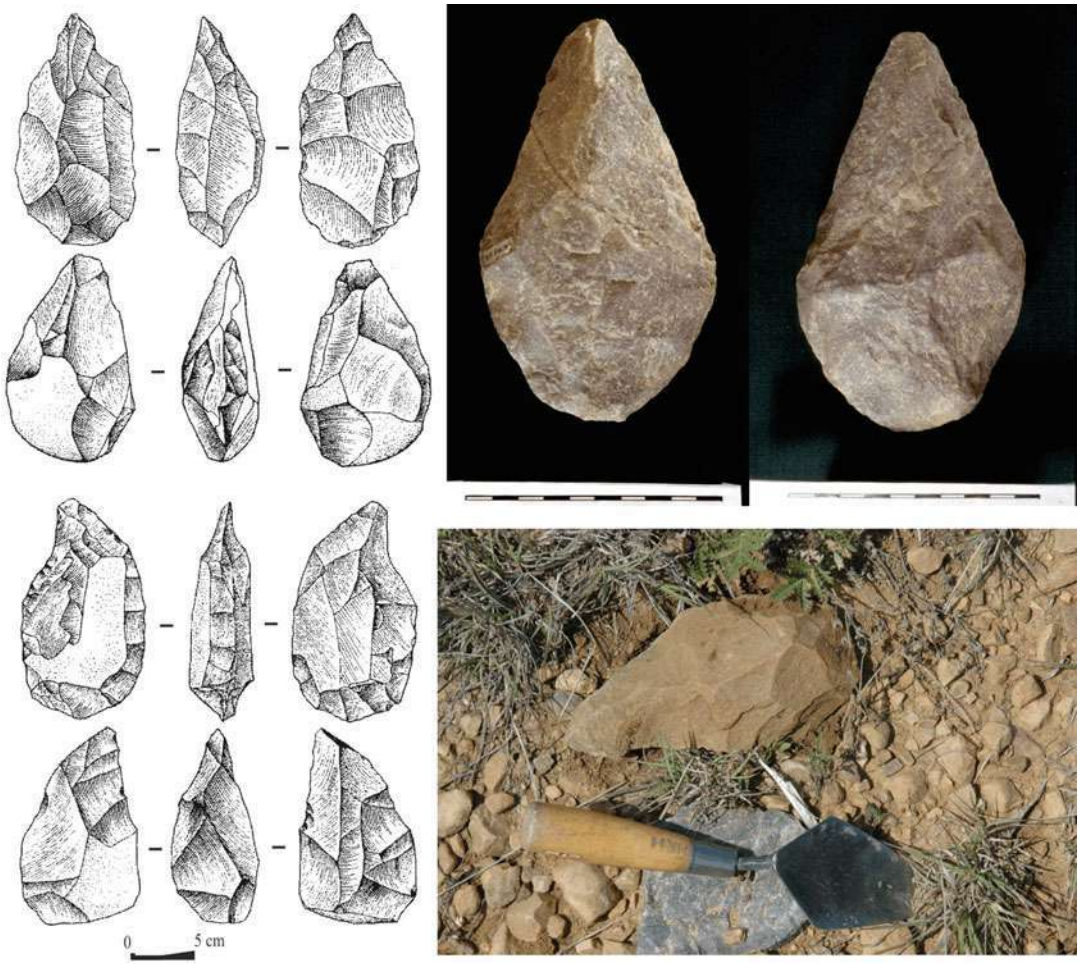
Hand axes, thinned bifacially and symmetrically into a triangular-shaped point, were regarded as diagnostic large cutting tools for the Lower to Middle Pleistocene lithic industries named Acheulea in Africa and Europe. For a long time, scholars followed the "Movius Line" theory for interpretation of cultural manifestations in the East Asia where there were no Acheulean-like hand axe but chopper-chopping tools instead. Only in the recent two decades have extensive surveys and field investigations revealed evidence for the existence of hand axe technology which has quickly changed many perceptions. The first recognitions of hand axe were spotty specimens

East Asia: Paleolithic, Fig. 4 A pebble-core chopping tool recovered from the Quyuanhekou site, Yuanxiang County, Hubei province

in North China, most without clear chronological data and substantial cultural contexts. The discovery of the Chongokni site in Korea in 1978 with hand axe did not make its data available until recently. In the mid-1990s, a surfaced collection of hand axe from the Early Middle Pleistocene formation at Baise (aka Bose) was reported. In the following years, over 200 hand axe were recovered in the Luonan base, yielding the largest clusters of hand axe in China. Today, hand axe are excavated with chronological data and contextual association from Baise, Luonan and Danjiangkou reservoir areas. A few samples of Luonan hand axe have been studied, showing that they were distributed over a wide space in different altitudes (2nd to 6rd terrace) and time (from 800 to 100 kya). Without detailed study, functions and social cultural implications of the hand axe from the Luonan Basin are yet to be understood; the same holds true for the other two regions, as the initial research on hand axe has been just unfolded.

It is suggested that both the Luonan and Baise hand axe exhibit diagnostic traits of the Acheulean technology from western Eurasia/Africa, although regional variations are also strongly present (Fig. 5). These hand axe were made on pebble cores, bifacially chipped to straighten the working edge toward the tip but leaving cortex and rough working surface near the proximal (butt) end. It is also evident that hand axe with similar morphological traits have been found at the Chongokni site in the Hantan river valley, South Korea, assigned to the Middle Pleistocene. Compared to the Mousterian classic Acheulean hand axe in the West, these East Asian versions seem to be crudely made prototypes; however, from the overall technological point of view, they share attributes of human modification similar to the Western hand axe. The difference in their appearance might be due to different raw materials and possibly to different functions as a result of adaptive behaviors to the East Asian environment. These observations led to some scholars who advocate local development of the bifacial technology (Gao 2012).

The discovery of hand axe has always stirred sensational discussions focusing on the concept of the "Movius Line" that drew developmental differences between elaborate hand axe culture in the West and crude chopper-chopping culture in the east. Since the first identification of hand axe from the Dingcun site, southern Shanxi province, in 1954, Chinese scholars have claimed that eastern Paleolithic cultures were not cultural backwaters as implied by H. Movius' syntheses. Today, it is clear that East Asia hominids produced cultures quite different from their counterparts in Europe and Africa. Regardless of whether the large cutting tools (including hand axe, cleavers, and picks) are similar or dissimilar to those in the West in term of measurements or attributes, the reasons why hand axe in such shapes appeared in the East Asia will be of interest to Paleolithic studies for years to come. For example, archaeologists working on the Baise assemblages believe that production of hand axe could be a behavioral adaptation to an episode of woody plants burning and widespread forest destruction that resulted in local cobble outcrops becoming available due to tektite events. According to Korean archaeologist



East Asia: Paleolithic, Fig. 5 Hand axe collected the surveys in the Luonan Basin, Shaanxi province

Choi (2004: 49), botanical evidence from Chongokni also points to a relatively warm climatic period, possibly in the interglacial Riss-Würm I–II.

Blade Technology

One of the first two Paleolithic sites known in the 1920s is a Late Paleolithic Shuidonggou (SDG), located in the southwestern Ordos region, about 18 km east of the Yellow River. The site was first excavated by French paleontologists E. Licent and P. Teilhard de Chardin, who reported five localities (Loc. 1–5) near Yingchuan (Ningxia province). Their investigations identified blade industries that were immediately assumed to have Western origins. Later on, the site had become the focus of study in 1960, 1963, and 1980 and ongoing investigations since 2003. The Shuidonggou lithic assemblage is dominated by blade cores and blades, made on local cherts and quartzite. Core platforms were well prepared before blade removal, indicating standard reduction procedures. Notably, 21.9% of cores recovered from the 1980 excavation season were classified as Levallois cores, more were also found from other excavation seasons.

A geological study at Shuidonggou suggests most occupations were situated on the second terrace of the Biangou River, and their cultural remains were buried within fluvial-shallow lake-alluvial sediment. Samples of U-series dating and conventional C^{14} dating indicate the age of Shuidonggou falls between 38,000 and 15,000 BP; however, recent AMS C^{14}dating suggests a narrower range of

between 29,000 and 24,000 BP. According to faunal analysis, pollen, and sediment studies, Shuidonggou was part of a cool and dry semi-steppe and prairie environment during this time; thus, the site might have served as a base camp for specialized hunters.

The recent field investigations, which produced surprising new data, allow us to reconsider our previous perception of the Shuidonggou complex. First, they have disclosed a highly populated occupation of the valley, lasting from the end of the Pleistocene to the beginning of the Holocene. Second, the sites yield many fired-clay floors and ash deposits indicative of purposeful fire use and/or areas of on-site activities. Third, and most importantly, a large number of finely perforated and polished ostrich eggshell ornaments (small beads) were recovered at SDG02, SDG07, and SDG08. The presence of such standardized craftsmanship indicates some level of organizational production in acquiring raw materials as well as in production itself. In addition, purposefully carved and decorated bones were identified at SDG02, possibly suggesting that the objects might have been used in relation to special functions or elite activities.

Shuidonggou blade technology seemed to remain the sole manifestation in China of its kind until the middle of 1980s, when the Youfang site was excavated (Fig. 6). Youfang is located in the east side of the Nihewan Basin and is slightly later in age than Shuidonggou. Youfang blade technology coexisted with microblade technology; however, most of the flake tools were made on classic blade blanks. Single platform cores display parallel long- and narrow-blade flaking scars, some with evidences of direct percussion. The discovery of the Youfang lithic industry suggests that this blade technology continued to spread eastward in northern China at the end of Pleistocene.

Data from Korea suggest that the appearance of blade technology could have been as early as 35,000 BP. The Sokchangni site, excavated in 1963, was the first site where blade technology was observed and the site was dated by radiocarbon C14 to 30,690 BP (Bae 2010a). These dates suggest Korean blade technology being parallel in

East Asia: Paleolithic, Fig. 6 Blade technology from the Shuidonggou site, Northwest China

timescale with Shuidonggou in China. According to Bae, blade technology was introduced to the Korean Peninsula via Shuidonggou from Siberia where blade industries, such as Ust-Karakol 1 and Kara-Bom in the Altai region dated to older than 40,000 BP, are predominant. This hypothesis may be also applied to explaining the emergence of blade technology to Japanese Archipelago, as the route of migration would continue from the Peninsula to islands during the cool and dry periods over land bridges. In Japan, blade industries appeared rapidly and blade-using populations might have migrated into the region after a massive volcanic eruption at the southern end of Kyushu at around 28,000 BP settled down (Ikawa-Smith 2007a). It was suggested that Late Paleolithic II in Japan is represented by blade technology, associated with a number of other technological variations including flake-core tools. The increase in the site numbers and the diversity of lithic technologies may be due in part to the population shift out of continental Northeast Asia.

Microblade Technology

Microblades, small bladelets as a truly compositional tool type, appeared as a result of sudden technological innovation and/or adaptation. The last stage of Late Paleolithic in East Asia has interestingly been homogenous technologically, represented by microblade industries. Although in China microblade sites appeared frequently compared to that of blades, numbers of microblade sites (about 50) and distributions are still limited (mostly to North-central China) in the context of Chinese Late Paleolithic materials. Even though the data of Chinese microblades are accumulated and summarized, detailed studies pertaining to their technological attributes and social-economic contexts are still lacking. On the other side, studies on Japanese wedge-shaped microblade technology have a long precedent, producing a number of publications in the English language. And precise accounts on microblade assemblages in Japan are amazingly recorded and worth noting: as of 2003, the 50 year investigation after the first discovery at the Yadegawa site, the total of 1792 microblade sites yield 83,137 microblades and 8,225 microblade cores (Sato and Tsutsumi 2007). The oldest microblade sites appeared in Hokkaido as early as 20,000 BP at the Kashiwadai 1 site. The date marks the onset of Japanese Late Paleolithic III. In Korea most lithic assemblages dating to the terminal Pleistocene are associated with microblade technology. At present, the record of microblade sites in Korea counts to 17 sites, with the earliest dated site at Jangheungni with a C14 date of 24,000 +/− 600 BP. Seong (2007) further divided the Korea microblade sites into two phases: earlier sites between 24,000 and 17,000 BP contain both tanged points (a diagnostic Late Paleolithic projectile points common in Japan and Korea) and microblade, and later sites younger than 17,000 are dominated by microblade without tanged points.

Chinese examples of microblade technology have been discussed with sites from Nihewan, Xiachuan, Xueguan, and Shizhitan. Both Dingcun 77:01 and Xiachuan sites were regarded as the earliest examples of microblade technology, dating to around 26,000 BP and 24,000–16,000 BP, roughly parallel with those earliest dated sites in both Korea and Japan. The Xiachuan lithic assemblage is represented by finely categorized flake tools made on fine black cherts. The tool types include burins, backed bladelets, projectile points, drills, and end scrapers, which were not common in the Early Paleolithic sites in North China. Recent studies on microblade industries in the Shandong Peninsula of East China suggests there were more regional variations indicative of high frequency of cultural interventions in North China (Fig. 7).

However, the reason for the sudden emergence of such technological-complicated microblade tools is still unclear. As far as the origin and spread of microblades in northern China are concerned, most Chinese scholars tend to support a “North China origin” model. Some suggest an eastward spread of microblade technology that originated at Xiachuan, through northern and southern routes into the Korean Peninsula, and proposed that boat-shaped microblade industries (China west) developed from wedge-shaped microblade industries (China east and Korea), but this hypothesis is not yet tested. However, data from other newly excavated sites in northern China – like Shizitan, Youfang, Jiqitan, and especially Qingfengqing and Fenghuangling in Shandong province – might challenge traditional views on the local

East Asia: Paleolithic, Fig. 7 Microblade artifacts from Shandong Peninsula, China, (**a**) and (**b**) microblades, (**c**) and (**d**) microblade cores

development of microblade technology in China. On the Japanese Archipelago, scholars tend to agree that the appearance of microblade technology was associated with migrations or diffusion from the mainland in two routes: north at Sakhalin-Hokkaido and south at Kyushu via Korea. Korean scholars do not claim the indigenous origins of microblade industries in Korea either.

Recent collective efforts on the study of origins and spread of microblade technology in Northeast Asia demonstrate that data from the region clearly indicates technological similarities among assemblages of northern China, Japan, Korea, eastern Siberia, and even to those from northwestern North America (Kuzmin et al. 2007). These studies reveal chronological data suggesting that the earliest use of microblade tools occurred in Central Asia, especially in Altai mountain regions. Microblade assemblages at Ust-Karakol 1, layers 10 and 9c, are dated to about 35,000–30,000, predated any sites with microblade in China, Korea, and Japan. As Ikawa-Smith correctly noted: "the Gorny Altai area, then, is more likely to be part of the general area in Eurasia where blade-based technologies developed, rather than the direct ancestral homeland of the microblade industries of Northeast Asia and northern North America" (Ikawa-Smith 2007b: 191). It is worth noting that based on new comparative studies, some scholars in China have started to hypothesize that microblade technology might have first emerged in Siberia and later spread southward into northern China.

Future Directions

With data becoming more accessible, in-depth research on the Paleolithic of East Asia is just unfolded. One of the current pressing issues in Paleolithic technology in this region is, as demonstrated above, the Acheulean industries in East Asia. Whenever studies are involved in the discoveries of hand axe, interpretations always center on the "Movius Line" theory known for more than half a century ago. This exemplifies a problem, that is, the research of East Asian Paleolithic needs to further develop its own paradigms based on what unique data this region can offer and how the data can first contribute to our understanding of its own remote cultural manifestations. Comparative studies are necessary, but data from the East Asian Paleolithic should not be treated as supplementary to arguments on prevailing theories that are of interests to the West. It cannot be denied that some Western scholars are only interested in the data that favors the theories and model-building that they advocate, especially regarding human evolution, resulting in the biased applications of out-of-context materials. Thus, it is of the foremost urgency to evaluate in full measures the East Asia data, which of course are still far from completed. Only with reliable time-scaled data can our future studies be truly placed into the syntheses of theory-buildings for distributions, migrations, and origins of technologies and human adaptations in East Asia.

Cross-References

- ▶ Acheulean Industrial Complex
- ▶ Archaic *Homo sapiens*
- ▶ Asian Paleolithic Association (APA)
- ▶ East Asia: Early *Homo* Fossil Records
- ▶ Handaxes and Biface Technology
- ▶ *Homo erectus*
- ▶ Human Migration: Bioarchaeological Approaches
- ▶ Lithic Technology, Paleolithic
- ▶ Movius Line
- ▶ Movius, Jr., Hallam L.
- ▶ Siberia: Paleolithic
- ▶ South Asia: Paleolithic
- ▶ West Asia: Paleolithic
- ▶ Yuanmou
- ▶ Zhoukoudian, Archaeology of

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East Asia: Rock Art

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Introduction

Rock art in East Asia is an archeological material found predominantly on open-air rock faces in mountain environments. Subjects range from distinctive anthropomorphic faces – seen at Helankou in northern China (Fig. 1), along the Ussuri and Amur rivers at the far eastern Sino-Russian border, and at Oponoho (Wanshan) in southern Taiwan – to whales – as at Bangudae in South Korea – to abstract and geometric symbols. This entry generally follows the United Nations Statistics Division's definition of East Asia, in which countries are grouped for statistical convenience rather than political or cultural affiliation. (See "Standard country or area codes for statistical use (M49)," available at https://unstats.un.org/unsd/methodology/m49/, accessed 14 June 2018.) East Asia thus denotes the geographical regions of mainland China, the Japanese islands, the Korean Peninsula, Hong Kong, Macau, and Mongolia, as well as the Taiwanese islands. (As of June 2018, Taiwan Republic of China is not a member of the United Nations, so is excluded from their statistical lists; however the region exists archeologically, so is included here.) Though most countries use regional period names to denote dates, terms like "Bronze Age" can refer to vastly different periods depending on the region. For the reader's convenience, all period names have been converted to numerical dates in this entry based on general academic consensus regarding periodization within each country. All dates are given in the BCE/CE system, with BP dates converted on the assumption that BP refers to 1950 CE. For further details, the reader is encouraged to pursue the literature cited.

Definition

Rock art throughout the vast region of East Asia is found in the form of rock-pecked images (petroglyphs), painted figures, and combinations thereof, where abraded areas of rock have been filled with red pigment (Jeon 2017; Ogawa 2014; Zhang Wenjing 2013; Jacobson-Tepfer and Meacham 2010). Rock art in East Asia is often considered to have been created by people who did not belong to the hypersedentary agricultural societies that dominate historical textual traditions, like early dynastic China (*c.* 1200–221 BCE) or Three Kingdoms of Korea (*c.* 1–688 CE). Rock art is, instead, considered intricately linked with either nomadic peoples (Tsakhilgaan 2016, 10–13) or hunter-gatherers (Dematté 2015, 615), though people from sedentary societies sometimes made additions to rock art panels, as in the case of a South Korean textual carving dated 525 CE that records successive ritual visits by royal clan members to the petroglyph site. Rock art through East Asia, however, attests to a diversity of environments, cultures, and traditions behind its creation. For instance, two major concentrations of petroglyphs

along the Daegok stream on the Korean Peninsula have vastly different foci: of 296 petroglyphs featuring identifiable subjects at Bangudae (2000–400 BCE), 58 (30%) are cetaceans, specifically whales, whereas at Cheonjeon-ri (*c.*2000 BCE–668 CE), 123 (57%) of 216 figures are ungulates, and there are only 5 (2%) cetaceans (Cultural Heritage Administration 2010). There is not space enough here to describe the traditions of each area in detail, so this section presents a brief overview of dating frameworks and methods to simultaneously highlight peculiarities in each of their rock art traditions.

East Asian rock art has been created over an extensive period, from at least as early as 10,050 BCE to the present day, though the intensity of making rock art varied by period. A general outline of deductive methods commonly used to date rock art – when the lack of organic material or projected expense eliminates radiocarbon dating as an option – can be given using the relatively thorough procedure used in the Altai mountains of western Mongolia. Jacobson-Tepfer (2015, 371–372) describes dating petroglyphs in this region as a subjective process reliant on deduction and discrimination. One indicator of a petroglyph's date can be the discoloration of the rock originally exposed to make an image, i.e., patina (Fig. 2). Though the rate of color change depends on a rock surface's location – which determines the weathering processes it undergoes – in addition to the chemical composition of the rock itself, older petroglyphs have accrued, in general, more patina than newer images (Jacobson-Tepfer 2015, 378). Other deductive methods include that petroglyphs formed of uneven marks made through direct pecking with a stone tool differ from ones with clearly incised or engraved outlines, as such marks were likely created with metal tools (Jacobson-Tepfer 2015, 372). As metal only appears in the Altai toward the end of the 3rd millennium BCE, the latter, clearly incised petroglyphs likely postdate this. Generally, however, direct pecking is the most common form of making petroglyphs in this region, with incising only increasing notably after *c.* 500 CE.

The subject matter of rock art can also be useful for dating; for example, horses (*Equus ferus*) are likely only ridden after 1300 BCE, but archeological evidence for the social reliance on horses and cultural expressions of this manifest after 1000 BCE; thus this serves as a likely *terminus post quem* for petroglyphs of anthropomorphs riding horses. Similarly, short, recurved bows appear in the archeological record predominantly after 1300 BCE, whereas, prior to this, a type of

East Asia: Rock Art, Fig. 1 Faces or masks carved in the Helan mountains, Ningxia, China. Photograph by the author

East Asia: Rock Art, Fig. 2 A petroglyph of a Eurasian elk (*c.* 2nd millennium BCE) that has been overlain by a modern carving of a personal name. The modern carving is bright white and visible from a distance, whereas the exposed rock of the elk has turned very dark. Biluut, Bayan-Ulgii, Mongolia. Photograph by the author

longbow was probably more common (Jacobson-Tepfer 2015, 374). Animal species can serve a similar role, as at Aral Tolgoi, Bayan Ulgii aimag, where many animal subjects that became extinct in the Altai are depicted, providing multiple dates before which petroglyphs of them were likely made, for example, ostrich (*Struthio* spp.), which disappeared from the region before 7050 BCE; rhinoceros (*Coelodonta antiquitatis*), which disappeared before 9750 BCE; and aurochs (*Bos primigenius*), which were present until *c.* 3050 BCE (Jacobson-Tepfer 2015, 118–119). Another technique for assessing the date of a petroglyph is to examine the style, or way a subject is depicted, as distinct differences are apparent between the "real-world" style common prior to 1000 BCE and later depiction of animals that refer to parallels in carved or cast portable art. Jacobson-Tepfer (2015, 378) describes the animals depicted in this later style as highly stylized, with unnaturally arched bodies, "twisted as if exploding" (Fig. 3).

The deductive reasoning highlighted above for dating rock art in the Mongolian Altai case study can be found throughout East Asia. For petroglyphs in the Yinshan of northern China's Ningxia and Inner Mongolia provinces, a broad dating framework based on rock art subjects was developed in the 1980s by Gai Shanlin and was heavily influenced by cultural evolutionary understandings of the past. Gai identifies an early hunting period (*c.* 8000–4000 BCE), the petroglyphs of which include extinct fauna like megaloceros (*Megaloceros luochuanensis*), ostrich, and Père David's deer (*Elaphurus davidianus*); a developed hunting and early farming period (*c.* 4000–2000 BCE), when anthropomorph petroglyphs increase in frequency, as well as representations of ibex (*Capra ibex*), sheep (*Ovis* spp.), and red deer (*Cervus elaphus*); early pastoralism (*c.* 2000–1000 BCE), which sees the appearance of horse, cattle (*Bos taurus*), sheep, and donkey (*Equus africanus asinus*) in the rock art corpus; a marked deviation in rock art methods after *c.* 1000 BCE; and a more modern period of rock art post *c.* 500 CE (Dematté 2004, 7–8). Though the date limits for the appearance of certain species have been altered, this framework is still generally adhered to by many Chinese researchers within and without the Yinshan area – indeed, the lack of any substantial, critical reevaluation of this framework is palpable. Gai also suggested that

East Asia: Rock Art, Fig. 3 Stone stele (deer stone) with multiple, stylized deer encircling it. The antlers run parallel to the deer bodies in a wavelike style and their muzzles are elongated. Jargalantym Am, Arkhangai, Mongolia, eighth to seventh centuries BCE. Photograph by the author

parallels for 1st millennium BCE Yinshan rock art could be found in the bronze artifacts of the Tagar culture (seventh to third centuries BCE) in southern Siberia (Dematté 2004, 7–9). Similar to the framework used for rock art in the Mongolian Altai, the Yinshan periodization reflects the fact that the majority of rock art in northern East Asia was created prior to *c.* 500 CE, with distinct changes in both visual and compositional styles *c.* 1000 BCE and 500 CE. On the Korean Peninsula, researchers consider a shield-shaped motif as paralleling artifacts excavated from archeological contexts dating to *c.* 1500–400 BCE, though most have been excavated from sites dating after 600 BCE (Jeon 2017, 218). Similarly, parallels between patterns found in petroglyphs at Oponoho, southern Taiwan, and pottery excavated from the site of Old Xianglan (*c.* 630–710 CE) in nearby Taimali township have been used to suggest a potential date for the images (Guoli taiwan shiqian wenhua bowuguan 2011).

Aside from subject matter, the two rock art sites on Hokkaido Island, Japan, have been dated according to geological processes. Fugoppe Cave was formed during a global warm period when the sea levels rose, which could potentially be either *c.* 2000 or 0 CE (Ogawa 2014, 48–49). As radiocarbon dates from material excavated inside the cave only attest to human presence *c.* 50 CE, researchers suggest the petroglyphs were created between *c.* 0–50 CE. Geological and environmental processes can also be used to provide a *terminus ante quem* for images, as was done along the Zuo River, Guangxi. Where researchers took two samples from the edge and interior of a stalactite covering an image, which returned radiocarbon dates of 2250 BCE, while another stalactite returned a date of 270 BCE (Demattè 2015, 622; Wang et al. 1988, 208). (The original publication by Wang et al. (1988, 208) does not state that the radiocarbon dates were calibrated or give the precise dates for each sample. Dematté's (2015, 622) description of their results, however, includes sample numbers, dates, and error margins for each of the four samples. Though she identifies the 1988 publication as her source, this information is not included by Wang et al., so it is possible that she retrieved her figures from the Heritage Department of the Guangxi Department of Culture or the Guangxi Museum directly.)

Historical Background

Rock art has been observed by various people throughout history, sometimes being reinterpreted by different cultures with no rock art-making tradition of their own. One example of this is the Daegok-ri petroglyphs on the Korean Peninsula, which were integrated during the Three Kingdoms period into historical records to form a founding narrative for the Great Gaya Kingdom (Jeon 2017, 139–140). The continuous reintegration of rock art into the immediate culture is part of the process of people constructing histories, cultures, and worldviews that Jeon (2017) calls "storytelling."

Alongside this continuous incorporation of rock art into contemporary culture, people have

similarly recorded its presence in a detached manner that many consider a precursor to modern research methods, such as the description in the fifth century CE Chinese text *Shuijingzhu*. This example has become significant in particular to modern Chinese research wherein researchers look for autochthonous precursors to modern research methods, which are commonly associated with European colonial activity in the eighteenth to twentieth centuries CE. Though the Temiya Cave petroglyphs on Hokkaido were, however, first recorded by Japanese researchers in 1866 (Ogawa 2014, 52), most trace early research on petroglyphs to European or Russian surveys of the nineteenth to twentieth centuries. Rock art in Tibet, for instance, was first mentioned in Francke's 1902 report on the Ladakh regional survey, which described petroglyphs west of Pangong Tso, while, in 1935, Tucci mentioned rock art near Gyantse town on the Myang Chu River (Zhang Yasha 2007, 45). Mongolian rock art, in contrast, was more the focus of Russian explorers, with Borovka making the first attempt to classify Mongolian rock-pecked images in 1927 based on petroglyphs along the Tuul Gol and Ulaan Khad (Tserendagva 2009, 55), though writings from the late nineteenth century make mention of petroglyphs earlier (Tserendagva and Tseveendorj 2016, 9). He distinguished two major groups that differed in content, style, and thus date: Scytho-Siberian petroglyphs, i.e., highly stylized animals seen on *c.* 1st millennium BCE portable objects and stele throughout southern Siberia, Central Asia (Fig. 3), and northern China (Jacobson-Tepfer 2015, 303), and Turkic-style petroglyphs, which are incised and commonly feature horse-riding anthropomorphs (Tserendagva 2009, 55). A major survey called the Historical-Ethnographic Expedition of the Russian Academy of Sciences was conducted in 1948, which revisited many known rock art complexes in western Mongolia (Tserendagva 2009, 56). Particularly in China, most major rock art surveys from the 1950s onward were conducted by local researchers, though most were only published in the 1980s–1990s, including multiple volumes on the vast regions of Xinjiang, Tibet, and Qinghai (see Further Reading). Similarly, South Korea's Yeoncheon Alteo petroglyphs were discovered in 1971 and were made the subject of particular national focus by the designation "national treasure" in 1976 (Jeon 2017, 128).

Following developments in archeological theory, which, during the 1950s–1970s, relied heavily on Marxist and Maoist thought, Chinese rock art research dated many sites according to the cultural-evolutionary framework of history, with particular emphasis placed on identifying supposed worship of male or female genitalia. The reasoning being that worship of male genitalia, as is argued for Kangjia shimenzi in Xinjiang's Qutubi county, would indicate that the rock art was made after the supposed transition from matrilineal/matriarchal societies to patrilineal/patriarchal ones *c.* 1000 BCE. Though some researchers acknowledge the issues with this, they simultaneously argue that a relative date provides a basis from which to explore an absolute date. The concept that history developed along a strict trajectory from least complicated to more complicated societies persists in Chinese academia, with many researchers conceptualizing rock art as the hallmark of a "primitive" peoples and traditions, that is, as a crude precursor to art. Despite broadening of the theoretical field over the past few decades, it is still common to link rock art to Western and Chinese aesthetics or use it to demonstrate that "primitive" peoples were equally capable of imaginative and abstract thinking (Zhu 2013, 153). Such attitudes run parallel, however, to varied approaches to rock art research appearing over the past decades, such as Matsumoto's (1997) cognitive approach to the petroglyphs of Inner Mongolia.

More recently, rock art research in China has been described as divisible into three types: surveys and reports that describe and date rock art content; analysis of the aesthetics of particular figures, their structure, artistic expression, and technique used to make them, a more art historical approach; and examinations of the rock art's context to reconstruct ancient societies – a more ethnographic or anthropological approach (Ren and Wang 2013, 67). An increasing number of digital methods have also been applied, including the digitization of Oponoho petroglyphs. The

isolation and inaccessibility of the mountain's four sites, even for local Rukai, formed the impetus for creating a 3D model of the site. Local Rukai were hired as guides and equipment porters, "to enhance the involvement of the aborigines in preserving the site," (Tseng et al. 2014, 483). The models were reportedly made openly available online (Tseng et al. 2014, 487–488), however, the publication provides no web address, and, as of May 2018, neither the models nor panorama photographs were found on the Oponoho website hosted by the National Museum of Prehistory (Guoli taiwan shiqian wenhua bowuguan 2011).

Key Issues/Current Debates

Current debates in East Asian rock art research revolve primarily around its purpose, connections between regions and across borders, and relationship to ethnic groups identified in modern times.

One of the most frequent explanations for the creation of rock art in East Asia is that it relates to ritual practice and human beliefs, though more nuanced interpretations of its role in societies and cultures also exist. In the Mongolian Altai, many petroglyphs are found in isolation on peaks, with certain ones having been re-pecked over time. Such attention and care for particular images suggests that they were the foci of worship, potentially locations where kin or cultural ancestors were celebrated and offerings made (Tsakhilgaan 2016, 10–13). Additionally, it has been suggested that a fundamental impetus for worshipping petroglyphs was a belief in protective magic, i.e., that honoring it could ward off disasters. Similarly, particularly large concentrations of rock art, like Cheonjeon-ri (*c.* 2000 BCE – 668 CE) in South Korea, are interpreted as sanctuaries for religious or spiritual activities (Lee 2011). It has been noted, however, that such rituals concerning East Asian petroglyphs likely served a variety of purposes, including the creation of boundaries between groups and the maintenance of cultural differences. Additionally, meanings of motifs were potentially revised over time, even between generations (Ponomareva 2018, 43–44). The interpretation that rock art was mainly created due to spiritual reasons has led researchers to link it with beliefs identified formally in the anthropological record, including animist ontologies like shamanism, with some arguing that shamans are represented in a variety of time periods, particularly in Northeast Asia (Jang 2005, 201). In some cases, the "shaman" depicted is purely an anthropomorph lacking in distinguishing figures, as at Bangudae, whereas the anthropomorphs in Fugoppe cave (Fig. 4), Hokkaido, are depicted as if wearing horns, feathers, or other accoutrements thought to indicate a merger of human and animal features associated with shamanistic rituals (Jang 2004, 216–218). Though its applicability as an interpretive framework is debated (Demattè 2004), the interpretation of an anthropomorph at Bangudae as a shaman dancing is reactive against entrenched attitudes in Korean academia that a protrusion near its crotch means it reflects worship of the male genitalia (Jang 2005, 204), and even those who put forward the shamanism interpretation remain cautious (Jang 2004, 222).

At a more refined level of analysis, debates on how and why specific rock art images were

East Asia: Rock Art, Fig. 4 A horned anthropomorph on a loose rock. The horns, or feathered clothing, are suggested to be evidence of shamanic ritual. Fugoppe cave, Hokkaido, Japan, *c.* 0–50 CE (After Ogawa 2014, Fig. 7)

created are far less united. Despite general attitudes that rock art was the product of past peoples' spiritual worldviews, individual images have been suggested as originating in daily life. From this perspective, past peoples saw a subject, created a visual expression of it in their mind according to the contemporary cultural ideology, then arranged these images according to their culture's visual principles, and pecked them into the rock (Zhu 2013, 152). Suggestions for what the image meant after its creation range from the idea that an image of an animal indicates that it was not a danger to humans, or that it served as a guide for how to distinguish it from other species (Shi 2012, 171). A common theme is, however, that rock art is by no means an "art" as understood by Western cultures. Shi (2012, 171) argues that the Western overreliance on phonetic scripts relegates everything pictorial to the field of "art" in the Western mind, whereas East Asia's historical familiarity with ideographic scripts allows researchers to understand imagery beyond the passive categorization of "art." In addition, he argues that presuming rock art served as "art" imbues it with aesthetic value and significance that it potentially never had. Consequently, Matsumoto (1997, 91) summarizes the situation succinctly when she emphasizes that researchers still do not know what the intentions of the rock art's creators were, regardless of the extent of speculation, as components of rock art are produced through unconscious decisions related to functions in the brain, as well as culturally derived knowledge and behaviors. Abstract symbols, in particular, have fallen afoul of such speculation, as Chinese researchers have alternatingly attempted to link them to precursors of the Shang Oracle Bone script (*c.* 1200–1045 BCE) of dynastic China, as well as astronomical phenomena (Zhu 2013, 153), which would presumably indicate a sophisticated precursor to scientific understandings of the world.

Despite prevalent ideas that rock art is a universal phenomenon, the sheer size of modern China within East Asia prompted a discussion in the 1980s of connections between rock art traditions of different regions. This manifested in Chinese research as the "northern" and "southern" categories, with the former represented by carved petroglyphs on open-air rock faces and the latter featuring red painted images. This has been refined by Zhang (2013, 59–61), who divides the country into three major rock art regions: the north, comprising predominantly animal images created through abrading or chiseling; the southwest, which features mainly anthropomorphic figures painted using red pigment on riverside cliff faces; and the southeast, comprising predominantly chiseled images of boats, wave patterns, and anthropomorphs. Rock art on Taiwan Island and Hong Kong is included in the southeast group, while rock art in Japan and Korea is increasingly linked to petroglyphs in Mongolia and, consequently, China's north. At a museum showcasing the petroglyphs of Fugoppe and Temiya caves in Hokkaido, the imagery was set among photographs of petroglyphs at the Amur River, Sino-Russian border, and the Daegok stream, South Korea (Jang 2004, 224), situating them within the context of Northern Asian rock art. In combination with the lack of other rock art sites in Japan, the similarity of the Fugoppe petroglyphs to examples from the Eurasian continent has led Ogawa (2014, 52) to suggest that those who made it originated from outside of the Japanese archipelago, while Jang (2005, 201) argues that the anthropomorphs along the Daegok stream and throughout Northern Asia demonstrate the existence of universal spiritual beliefs and a, "homogeneity in the fundamental culture." Alternatively, though from these macroscopic perspectives Mongolia's rock art is linked to that of China's north (Jacobson-Tepfer 2015, 302–303), more refined regional groupings are commonly used to identify differences in Mongolia's particularly rich rock art record, such as petroglyphs of the Altai as opposed to those of the Gobi (Tsakhilgaan 2016).

International Perspectives

Similar to other parts of the world, East Asian rock art studies have been strongly influenced by the shamanism paradigm, with researchers interpreting rock art *a priori* as showing shamanic rituals. As, for many researchers, shamanism is a

religion of Siberia and the Eurasian Steppe, this interpretation allows them to link rock art with broader Eurasian belief systems, but such a relationship is often questionable. International critiques of its usage in East Asia are that the paradigm relies on preconceptions of "primitive" vs "civilized" societies, wherein the latter are considered highly complex but the former are broadly similar worldwide (Dematté 2004, 11). This allows researchers to utilize modern ethnographies to explain prehistoric remains, with little justification of their applicability. As shamanism was first documented among the Evenk, it has been suggested that it be treated as a Siberia-specific system in appropriate contexts only, such as for archeological remains along the Ussuri and Amur rivers. Other international researchers have, however, noted tendencies in East Asia toward beginning with the visual evidence before working toward broader interpretative frameworks (Bale 2015, 230), demonstrating that the shamanism paradigm is, in some cases, losing ground.

Regional nationalism is a concern for rock art research in East Asia, as it encourages interpretations relating to the origins of modern ethnic groups, mass migration, and cultural diffusion. Though this is an issue for all archeological fields, these interpretations are considered outdated in Anglophone research (Bale 2015, 230; Dematté 2004). Collaborative international projects can also be drawn into nationalist frameworks, in which cases the research aim becomes the validation of a political agenda. An example of this is an English article on the rock art of Yunnan, southwest China, which explores the likelihood that the images represent an autochthonous tradition rather than the influence of European painted rock art (see Further Reading). Conversely, a volume on the Bangudae petroglyphs of South Korea suggests that the images' creators migrated from the Altai Mountains (Bale 2015, 230). In these two examples, the researcher is attempting to prove or deny long-distance relationships that validate specific sociopolitical agendas (Bale 2015, 230) and what the evidence shows can be changed according to what one wants to find. Similar to interpretations of shamanism, nationalist-related arguments typically lack analytical justification (Dematté 2004, 10). Though nationalism's effects can be far more radical than simply coloring interpretations of the past, the examples presented here demonstrate how popular nationalism can permeate every aspect of society and prevent archeological evidence from being examined on its own terms.

Finally, an interpretative framework gaining in popularity among international researchers is the landscape approach, which essentially manifests as increased consideration for the landscape's role in the past. The argument is made that the landscape played a major role in people's decisions to create open-air rock art, and it refers to factors like travel routes and topographical landmarks (Dematté 2015, 616). This approach does not rely on environmental factors as explanations for archeological remains but portrays rock art as a process enacted within a space comprising other structures (human-made and natural), histories, and societies (Jacobson-Tepfer and Meacham 2010). Identifying that rock art along the Zuo River is primarily found on river bends, for instance, leads Dematté (2015, 625) to suggest that the rock art was designed to be visible from nearby villages, as the particularly steep rock surfaces were themselves very visible, whereas previous interpretations rely on historical ethnographic parallels. The landscape approach familiar to Anglophone research is not, however, unheard of in East Asian research; a landscape study has been published for rock art in northern China's Badain Jaran, but similar studies are lacking.

Future Directions

Digital methods are increasingly being used to improve the level of detail in rock art studies. The application of simple methods, such as altering image tone digitally, is allowing researchers to more accurately identify badly damaged figures and the sequence of figure overlap, which has significant implications for our understanding of dates and the process of building up panels with

East Asia: Rock Art, Fig. 5 The petroglyphs on this panel all have the same patina colour due to their age, however, each one may have been made weeks, months, or years apart by different people. Bayan-Ulgii, Mongolia, precise date unclear. Photograph by the author

multiple, varied images. It is still relatively common to encounter researchers who treat all rock art on one panel as a single set, regardless that each image may have been made on a different date by different people (Fig. 5) (Ren and Wang 2013, 67). Consequently, rock art "stratigraphies" represented through manipulated photographs are becoming increasingly common in publications (Ren and Wang 2013, 71). The technique is described as a means to improve objective recording of rock art, which will make the discipline more scientific (Ren and Wang 2013, 73). Alternatively, other researchers are using digital technologies to make rock art more accessible to nonacademics and enhance public engagement. Tseng et al. (2014, 488) express the hope that a digital, visual database of Oponoho will be used to create 3D, interactive exhibitions that will be more interesting to the public.

Simultaneously, there is an ever-growing trend among international researchers toward understanding rock art as a process enacted within various social, cultural, and political activities. Whether the aspect of past society being explored is belief or cultural interaction (Jacobson-Tepfer 2015, 351–368), researchers are increasingly approaching East Asian rock art as an active agent that played a role in creating human societies, rather than a passive reflection of their attitudes and economies (Ponomareva 2018). This requires, however, greater engagement with contemporary archeological remains, which has not been supported until relatively recently (Ogawa 2014, 51). What this entry has highlighted, however, is continuously increasing transnational collaboration, as well as diversification of the methods used to study rock art throughout East Asia, which will hopefully also lead to more productive cross-disciplinary approaches.

Cross-References

- ▶ Huashan Mountain Petroglyphs
- ▶ Nationalism and Politics in Chinese Archaeology
- ▶ Rock Art of Siberia: Baikal and Transbaikal Regions
- ▶ Taiwan: Archaeological Museums

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Eastern North America: An Independent Center of Agricultural Origins

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Introduction

As early as the 1930s, a group of native seed-bearing plants excavated from dry rockshelter sites in Kentucky and the Ozarks of Arkansas, and Missouri presented themselves as candidates for a possible indigenous eastern North American crop complex. Not until fairly recently, however, have archaeological and genetic techniques – especially AMS radiocarbon dating, scanning electron microscopy, flotation recovery of charred plant remains, and analysis of both modern and ancient DNA – convinced all researchers that eastern North America is a legitimate, independent center of plant domestication. Peter Bellwood (2005: 158) described this discovery as "one of the major recent achievements of U.-S. archaeological research. . .."

Domestication in this region contrasts with agricultural origins in some other parts of the world. Selection for useful crops took place after the early Holocene Neolithic time frame of southwestern and eastern Asia, for example, and it does not appear to have been motivated by climatic stress, regional population pressure, or the desires of aggrandizing elites for surplus or luxury foods. Still, the pre-maize Eastern Agricultural Complex (EAC) of North America became a widespread and entrenched economic system concurrent with increasingly long-term occupation of rich riverine zones and with an upswing in long-distance trade among groups who practiced elaborate rituals that probably included feasting and seed exchange.

Key Issues/Current Debates/Future Directions/Examples

The Indigenous Eastern Crops

Eastern Squash/Gourd (*Cucurbita pepo* ssp. *ovifera*)

A native subspecies closely related to the Mesoamerican pumpkin (*Cucurbita pepo* ssp. *pepo*), the eastern *ovifera* squash/gourd was cultivated as early as 7,000 years ago in Illinois and 1,000 to 2,000 years later in Pennsylvania, Maine, and probably many other places. By 2500 BCE, selection for larger fruits and seeds and thicker rind can be detected archaeologically, establishing this species as one of the earliest domesticates of the Eastern Woodlands. The seeds and flowers would have been valued for food, and the hard-shelled

fruits had multiple uses: containers, rattles, and fishnet floats, among others (Asch and Asch 1985; Fritz 1999). Varieties with non-bitter flesh were also bred during this process. Molecular biologists have determined that modern commercial cultivars including yellow crooknecks, pattypans, and acorn squashes – as well as many of the seasonally popular ornamental gourds – are descended from this lineage now known to have been domesticated in eastern North America (Decker-Walters 1990).

Sunflower *(Helianthus annuus* var. *macrocarpus)*

Sunflowers were grown by indigenous eastern North American farmers at the time of European contact and therefore accepted by scholars as having been a native domesticate long before other members of the EAC joined them in that category (Heiser 1955). The earliest domesticated seeds and fruits – those that are larger than their wild counterparts – come from the Hayes site in eastern Tennessee, dating to 2300 BCE in the Late Archaic period (Crites 1991). Selection for larger and larger seeds and for monocephalic plants (those having a single large flower head rather than many smaller side branches) continued during subsequent millennia, although in some regions such as the Iroquoian area of the Northeast, relatively small-sized seeds were favored, perhaps due to high-quality oil. Sunflower seeds were eaten in porridges, stews, and breads, and the seed oil was used cosmetically.

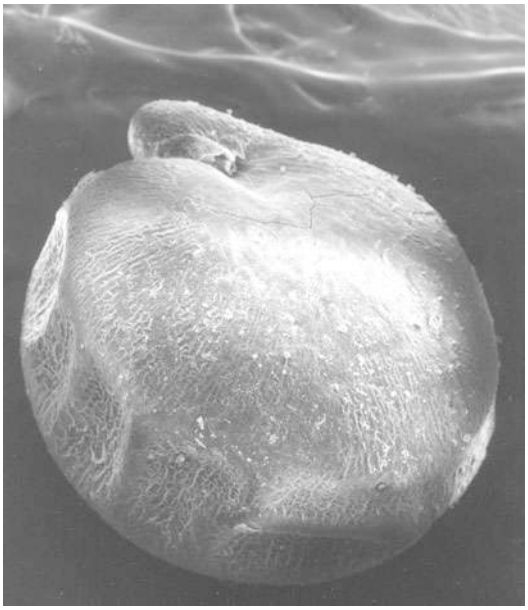
Sumpweed *(Iva annua* var. *macrocarpa*)

Sumpweed or marshelder (Fig. 1), which is closely related to sunflower, was also domesticated during the Late Archaic period (3000–1000 BCE), with the earliest larger-than-wild-sized specimens coming from the Napoleon Hollow site in west central Illinois and also, like sunflower, dating to 2300 BCE (Asch and Asch 1985). Human paleofeces from Salts and Mammoth Caves in Kentucky, left by cavers between 2,000 and 2,500 years ago, contain irrefutable evidence that people ate the unshelled kernels of sumpweed along with sunflower and other native crops, but because sumpweed had disappeared as a cultigen before Europeans described its uses in writing, we have no recipes or descriptions of how it was cooked.

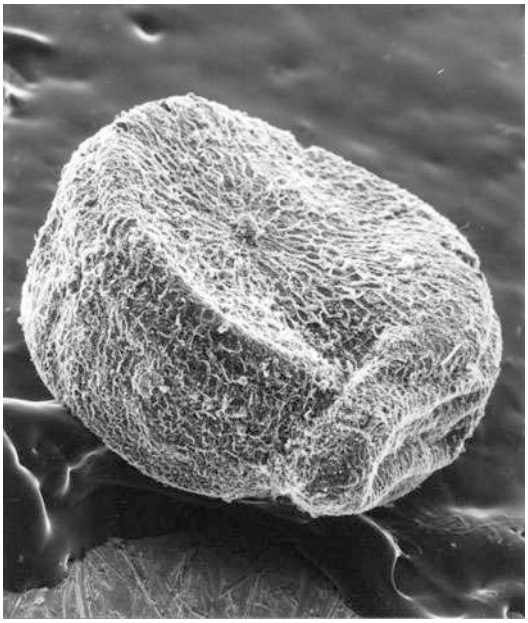
Chenopod or Goosefoot *(Chenopodium berlandieri* ssp. *jonesianum*)

One of the most important native North American crops was a close relative of the now-popular Andean grain called quinoa (*Chenopodium quinoa*), and it shared quinoa's high protein composition and other advantages such as prolific productivity. Rather than having been bred for larger seeds, cultigen chenopod seed coats became thinner and smoother, resulting in at least one variety with very thin, black seed coats and another variety similar to modern quinoa that had pale-colored seeds. Both of these crop types were found at the Riverton site in southern

Eastern North America: An Independent Center of Agricultural Origins, Fig. 1 Domesticated sumpweed (*Iva annua* var. *macrocarpa*) specimens from Alum Cave, Arkansas Ozarks



Eastern North America: An Independent Center of Agricultural Origins, Fig. 2 Dark-seeded cultigen chenopod (*Chenopodium berlandieri* ssp. *jonesianum*) specimen from Edens Bluff, Arkansas Ozarks



Eastern North America: An Independent Center of Agricultural Origins, Fig. 3 Pale-seeded cultigen chenopod specimen from Whitney Bluff, Arkansas

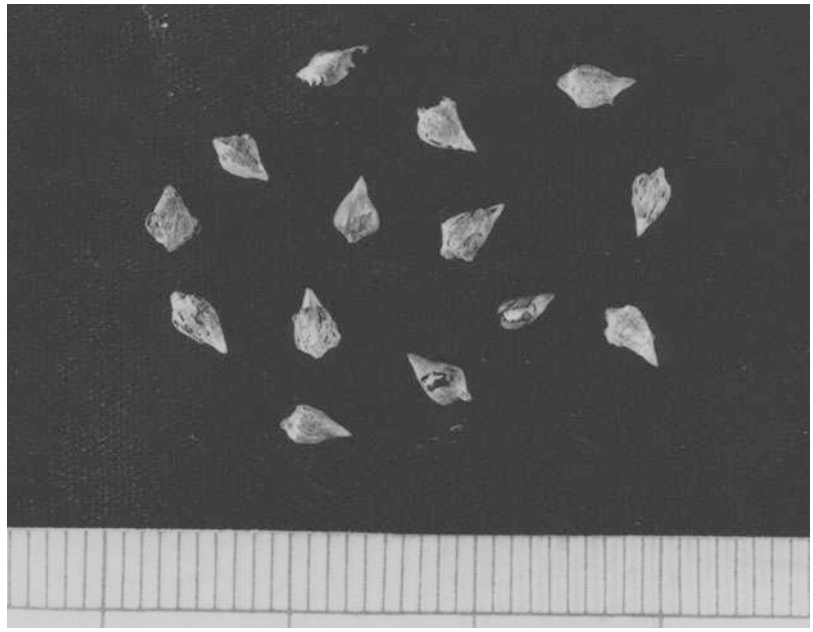
Indiana, dating to 1800 BCE, along with squash rind and domestic-sized sunflower and sumpweed seeds (Figs. 2 and 3). Riverton is currently the earliest site at which most EAC crops have been found together (Smith and Yarnell 2009).

Erect Knotweed (*Polygonum erectum*)

A member of the same family as buckwheat (*Fagopyrum esculentum*, a Eurasian crop), erect knotweed was clearly a member of the EAC by 500 BCE. It was stored along with the known domesticates in rockshelter sites and caches (Fig. 4). This species did not initially change dramatically in size or shape from its wild ancestral form and therefore is referred to as "cultivated," meaning intentionally propagated but not necessarily fully dependant on farmers for its survival. By CE 1000, however, a few sites in Arkansas and Illinois held concentrations of knotweed specimens slightly larger and with smoother fruit coats than any known wild populations (Fritz 1990). Stands of erect knotweed are rare today, so insufficient comparative research has been carried out, and more measurements and detailed scrutiny are needed.

Maygrass (*Phalaris caroliniana*) and Little Barley (*Hordeum pusillum*)

Two small-seeded native grasses are frequently found in depositional contexts along with other crops, although they, like erect knotweed, are usually classified as "cultivated" rather than domesticated due to doubts about the degree to which they were altered genetically or phenotypically. Maygrass has been recovered from sites well outside its modern geographical range, as far north as southern Wisconsin (Fritz in press). Today, wild maygrass (Fig. 5) does not grow in the Mississippi River Valley north of the Missouri Bootheel. Numerous bundles of maygrass seed heads from storage contexts in Ozark rockshelters and thousands upon thousands of maygrass seeds recovered by flotation from pits dating between CE 100 and CE 1300 in Illinois, Missouri, Arkansas, and Tennessee constitute strong evidence that this species was highly valued across the Midwest Riverine area. Like little barley, maygrass ripens in the early summer, a time when stored grains are depleted and other crops are not yet producing seeds. Concentrations of maygrass seeds occur in association with unusually high numbers of tobacco seeds at sites in Missouri, Alabama, and



Eastern North America: An Independent Center of Agricultural Origins, Fig. 4 *Polygonum erectum* from stored seed cache found at Whitney Bluff, Arkansas

Eastern North America: An Independent Center of Agricultural Origins, Fig. 5 Modern maygrass (*Phalaris caroliniana*) growing in Bolivar County, Mississippi

Illinois, including Cahokia Mounds (Fritz in press). In Wisconsin, maygrass was found at sites where Mississippian colonists from the Cahokia region apparently carried it with them when they moved north (Egan-Bruhy 2003). This raises the possibility that as a first fruit, maygrass held a special status in rituals or that it was a key component of identity associated with ancient foodways before maize became the dominant staple.

Unlike maygrass, little barley's natural range today corresponds to its archaeological range, and little barley has not been found stored in sheaves in dry rockshelters or in special contexts. Still, very high frequencies of little barley seeds are commonly found in pits and middens along with the other EAC crops, especially in Illinois, Missouri, and eastern Arkansas, and morphological hints of selection for free-threshing grains have been described (Hunter 1992).

Discussion: Pre-maize Eastern Agriculture

Cultivation and domestication of squash and seed plants in eastern North America was initially conducted by members of social groups who were adapting to stabilization of floodplain regimes and becoming increasingly effective managers of temperate forest resources. A combination of factors can be implicated in the process. Conscious human selection entailed the isolation of types of plants with particular traits by planting seeds in new places and choosing seeds from the most desirable plants to serve as future seed stock. At the same time, unconscious selection operated when the seeds best adapted to enhanced competition outgrew their neighbors in plots where humans had disturbed the soil, fertilized it organically, and opened it up to sunlight through clearing. This evolutionary advantage favored larger-than-average seeds and those with thinner coats that promoted early germination.

By the end of the first millennium BCE, the suite of crops discussed above was widely grown across the Midwest Riverine area. Paleofecal studies at Salts and Mammoth Caves, Kentucky, demonstrate that up to two-thirds of observable dietary remnants were contributed by these native seed crops between 200 and 500 BCE (Yarnell 1974). However, the diet of Early Woodland cavers, who spent many hours deep underground in pursuit of minerals, might not represent the typical subsistence economy. Flotation recovery of charred plant remains has yielded great numbers of EAC seed types from settlements dating to the first millennium CE (Middle and Late Woodland periods) across this same zone. Opinions differ as to how large a part of the diet came from native agricultural products as opposed to wild plants and animals, and it is likely that the amount of time and effort devoted to farming varied considerably from place to place and perhaps even from year to year. Researchers such as Bruce Smith (2001) describe these groups as low-level food producers for whom domesticates constituted less than 50% of the caloric intake but who nevertheless depended heavily and successfully on the native crops over an extended time period.

Addition of Maize and Other Mesoamerican Crops

Maize (*Zea mays* ssp. *mays*) was domesticated before 4300 BCE in Mexico, and it spread into the US Southwest by 2100 BCE (Browman et al. 2009). The earliest evidence so far for maize in eastern North America dates to 350 BCE, based on phytoliths extracted from charred cooking residues on pots from New York and Michigan (Hart et al. 2012). Genetic studies of modern maize indicate that eastern North American varieties of maize have their roots in the Southwest (Matsuoka et al. 2002), so maize seems to have spread eastward across the plains during the Early Woodland period (1000–100 BCE). Archaeological visibility in the east remains very low until approximately CE 800, when the abundance of charred cob and kernel fragments increased dramatically in the central Mississippi River Valley (Simon and Parker 2006). During the next few centuries, maize was fully incorporated into farming systems based on the indigenous seed crops, and it was also adopted to the south, east, and north of the Midwest and Midsouth zones where the EAC had flourished for more than 1,000 years and in places for more than 2,000 years.

A satisfactory explanation is still being sought for why it took so long for maize to become a staple rather than minor food source even though most modern Americans view it as clearly superior to the "weedy" EAC crops. Suggestions involve its possibly restricted use early on to ceremonial occasions or its hypothetical lack of productivity until varieties that were bred were well adapted to eastern environments (Hart 1999). The scanty and fragmentary evidence for maize cobs or kernels predating CE 800 makes this mystery extremely difficult to solve. Eventually, of course, maize was grown successfully in large quantities, and many different methods for preparing and serving it became central to the foodways of Native eastern North American societies, as did its role in harvest rituals and world view in general.

By CE 1000, a species of Mesoamerican squash – the green striped cushaw (*Cucurbita argyrosperma* ssp. *argyrosperma*) – had also been carried across the plains, joining the native *ovifera* pepo squash. Common beans (*Phaseolus vulgaris*) were the last pre-Columbian addition to eastern farming systems, arriving perhaps no earlier than CE 1200 (Hart and Scarry 1999).

The indigenous crops were not immediately replaced by maize, although only sunflower and

the eastern squash were still grown when Europeans began recording their observations of Native American farming systems. As a group, chenopod, maygrass, erect knotweed, and little barley outnumber maize fragments in many Emergent and Early Mississippian (CE 800–1200) pit features in the Central Mississippi Valley (Simon and Parker 2006). The native cultigens contributed in a key way to agricultural strategies in the fertile American Bottom area surrounding Cahokia Mounds, the largest population center north of Mesoamerica, where together with maize, they afforded biodiversity, stability, and resilience.

Conclusion

Agricultural fields in eastern North America came to be dominated by corn, beans, and squash, but the system based on these "Three Sisters" developed only a few hundred years before European colonists arrived. Across the interior of the Eastern Woodlands, maize-based farming was preceded by a long tradition of indigenous crop production that persisted and was even intensified in some regions after maize became a major food item. All of the native crops except sunflower and *ovifera* squash, however, were either no longer planted after CE 1500 or had become too casually cultivated to be documented securely in historical archives. Because their wild relatives are viewed by Americans today as weeds, pre-maize agriculture was slow to receive the recognition it deserves. It now stands as a fascinating example of a productive and seemingly sustainable component – together with hunting, fishing, and wild plant harvesting – of a mixed and flexible economic strategy that nourished generations of Native Americans including complex mound builders and their neighbors.

Cross-References

- North American Mound Builders: Hopewell, Natchez, Cahokia
- Paleoethnobotany
- Phillips Spring: Agriculture and Domestication
- Plant Domestication and Cultivation in Archaeology
- Quinoa: Origins and Development
- Squash: Origins and Development
- Woodland and Mississippian Cultures of the North American Heartland

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Eastern Provinces of the Roman Empire, Archaeology of the

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Introduction

The eastern provinces of the Roman Empire were those situated in the regions of Asia Minor, Mesopotamia, Syria and Palestine, Northwest Arabia, and Egypt. This large swathe of territory had long been contested by past empires (Egyptian, Neo-Babylonian, Neo-Assyrian, Hittite, Persian, Macedonian) and fragmented into a number of rival kingdoms during the Hellenistic period. The Roman East is a study in diversity; the landscapes, ethnicities, cultural norms, and historical traditions vary widely. Much recent work in Roman archaeology explores the interaction between Rome and her subject populations, measuring how Roman power and culture were experienced and expressed in local contexts. Given its multicultural and multiethnic composition, the eastern provinces offer a number of compelling case studies relevant not only to the study of Roman archaeology but archaeology as a global discipline.

Definition

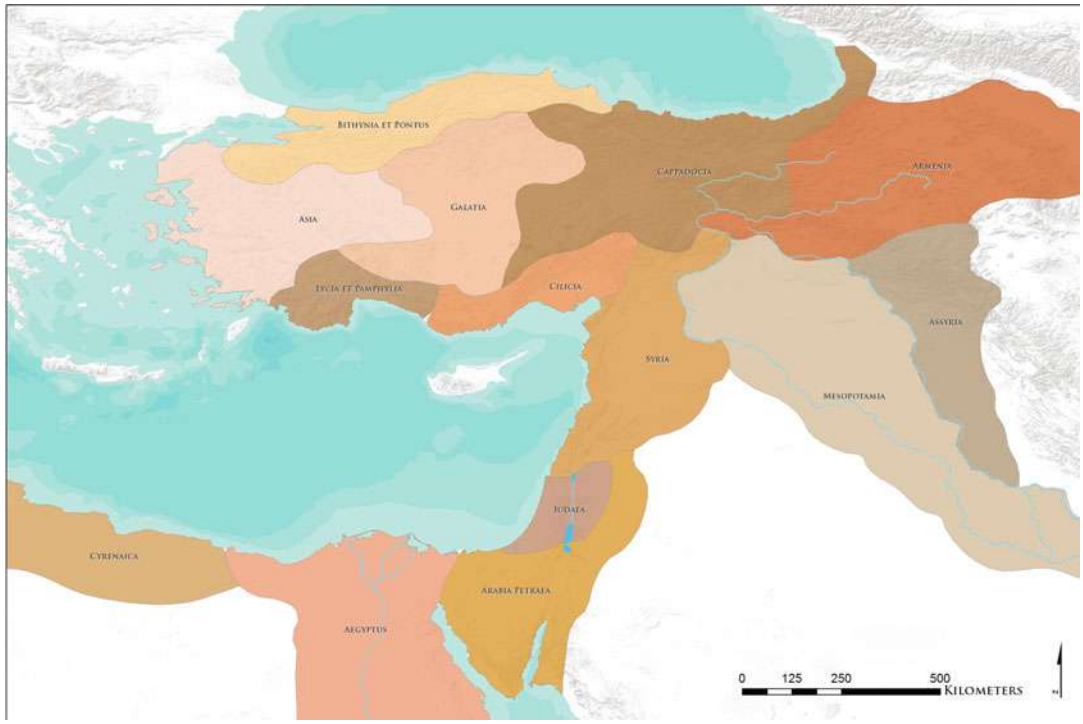
Description of the Provinces

The boundaries and administrative designations of the provinces changed several times during the course of the empire, which is broadly defined as the period beginning in 31 BCE (Octavian's victory at Actium) and ending, at least as a viable entity in the East, with the decisive Muslim victory at the Battle of Yarmouk in 636 CE. In the High Empire of the second century CE, there were 13 provinces in the East: *Bithynia et Pontus*, *Asia*, *Galatia*, *Cappadocia*, *Cilicia*, *Lycia et Pamphylia*, *Armenia*, *Assyria*, *Mesopotamia*, *Syria*, *Iudaea*, *Arabia Petraea*, and *Aegyptus* (Fig. 1). In the Late Empire, the number increased dramatically; for example, the province of Palestina (itself a subdivision of Syria) was split into *Palestina Prima*, *Palestina Secunda*, and *Palestina Tertia*. For description of the administration of the provinces and their historical developments, see Sipilä (2009).

Historical Background

The Roman history of the Eastern Mediterranean really begins with Alexander the Great (r. 336–323 BCE), whose policy of veteran settlement drastically transformed the political and cultural landscape of the region. Cities were founded or resettled throughout Asia Minor, the Near East, and Egypt and were invested with Greek infrastructure including theaters, temples, and administrative centers. Veterans were given land grants and encouraged to marry into the local population. During the Hellenistic period, the entire Eastern Mediterranean was subjected to a continuous negotiation of cultural reassessment; the populations ultimately encountered by Rome were inconsistent and diverse.

In the late third century BCE, Rome's eastward expansion began in earnest. Following victories over Philip V in the Macedonian Wars (214–148 BCE), Rome pushed into Syria, conclusively defeating Antiochus III. Under the terms of the Treaty of Apamea in 188 BCE, Rome was awarded control of Asia Minor. The new territories



Eastern Provinces of the Roman Empire, Archaeology of the, Fig. 1 The Eastern Provinces in the 2nd c. CE (approximate boundaries)

were temporarily ceded to the client kingdom of Pergamon, but following the death of Attalos III, all Pergamene holdings were transferred again to direct Roman administration. Confrontations with Mithridates VI of Pontus proved a temporary setback, but following his defeat at the hands of Pompey the Great, Roman hegemony in Asia Minor was never again seriously questioned. Pompey's campaign in the East struck at Syria and Judea as well. In short order, Pompey absorbed the remainders of the now-fragmentary Seleucid Empire, also adding Judea and Armenia as client states. By 63 BCE, Roman hegemony in the East was well established; only Parthia, Arabia, and Egypt lay outside Rome's control (Ball 2000: 8–19).

In the middle of the first century BCE, Rome's civil wars drew in the entire Mediterranean. The conflict between Cleopatra VII, Marc Antony, and Octavian culminated in the Battle of Actium (31 BCE), marking a final and conclusive victory for Rome over Egypt. Soon after, Egypt was added as a personal possession of the young *princeps*. In 25 BCE, Aelius Gallus conducted a campaign in Arabia that was, according to Strabo, a near-total disaster; nevertheless, Rome claimed victory. Throughout the first century CE, Rome was content to allow the kingdom of Nabataea, centered at Petra in Jordan, relative autonomy in Arabia, but in 106 the region was formally annexed as *Arabia Petraea*.

Over the duration of the empire, the wealth and large population of the Eastern Mediterranean made it the consistent center of attention. Numerous wars were fought in the East, either against external threats, such as the Parthians, or internal rebellions – the Jewish revolt (66–73 CE) among the most significant. The number of Roman soldiers stationed in Syria meant that generals there had considerable power, and some mustered the support of these troops in order to lay claim to the imperial mantle. For this reason, the provinces of the Near East were subdivided by Septimius Severus; this was part of a long-running tradition of imperial redistricting in the East.

Parthia, a rival of Rome since the Republic, was finally and completely subjugated by Severus. The Sassanians, the next major Iranian dynasty, continued to wage war with Rome during the troubled third century CE, culminating in the capture and apparent execution of Valerian in 260 CE. Zenobia of Palmyra revolted against Rome in 269, briefly seizing control of most of the Eastern Mediterranean. Rome's grip on the East was weakening, and it was partially for this reason that Diocletian's political reforms shifted the seat of power to Nicomedia in Turkey. This change in focus was affirmed by Constantine's relocation of the imperial court to Constantinople. Despite these moves, however, the growing Sassanian Empire continued to absorb Roman holdings in the East. The Byzantine Empire maintained a presence in the Middle East until the Muslim conquests of the seventh century CE. Constantinople itself would not fall until the fifteenth century, but for all intents and purposes, the Rashidun and Umayyad conquests brought an end to the last remnants of the Roman Empire in the Middle East and Egypt.

Key Issues/Current Debates

Archaeology in the Eastern Provinces

The Fertile Crescent and the Nile Valley are among of the most important archaeological contexts for the rise of civilization, and unsurprisingly Roman archaeology has often been overshadowed by investigations into the ample and dazzling remains of Pharaonic Egypt or the great city-states and empires of Mesopotamia. Leonard Wooley's excavations at the Royal Cemetery of Ur and Howard Carter's discovery of Tutankhamen's tomb captured the public imagination in a way that the familiar colonnades and temples of Roman cities never could.

Even so, the remains of Roman cities are among the most iconic symbols of the region. The great cities of Mesopotamia and Egypt, built largely out of mudbrick and in the proximity of rivers, are largely gone. Roman cities, on the other hand, were substantial stone constructions and remain visible across the landscape to this day. Powerful earthquakes leveled the urban infrastructure of much of the region in the late Byzantine Empire, which led to widespread urban abandonment. As a result, major sites are preserved in often spectacular condition. The allure of these cities (Palmyra and Ephesos but two representative examples) attracted the attention of European explorers and travelers in the seventeenth–nineteenth centuries, and unsurprisingly the bulk of early archaeological work in the region was focused on these major urban centers.

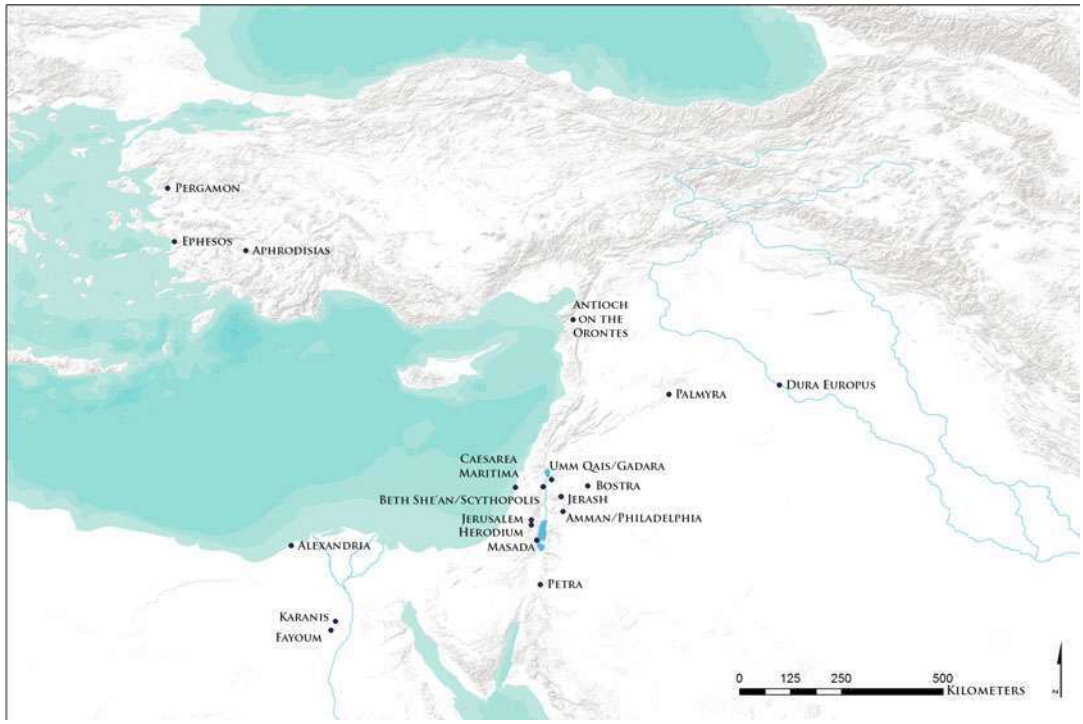
Given the breadth of Rome's eastern provinces, it is impossible to offer any sort of comprehensive catalogue of archaeological work. What follows is a brief synopsis of some major sites in the region; the list is meant to be representative rather than comprehensive (Fig. 2).

Asia Minor

Aphrodisias: Excavations in Aphrodisias in Caria have revealed a prosperous city centered around the Temple of Aphrodite, including a number of civic buildings and a well-preserved theater. Most notable is the *Sebasteion*, a large temple complex dedicated simultaneously to Aphrodite and the Roman emperors. Numerous sculptural fragments have been recovered from the porticoes flanking the processional way, which depict both mythological figures, heroizing portraits of the Julio-Claudian emperors, and personifications of the various ethne of the empire. As such, it is an essential document for the study of the nature and impact of the imperial cult (Smith 1987).

Ephesos: Ephesos was one of the largest cities of the Roman world, famed for its storied Temple of Artemis. Little remains of the temple today, but the ruins of the Roman town are extensive. Typical of major cities in the East, Ephesos boasted multiple temples (one dedicated to Domitian and another to Hadrian), fountains, colonnaded streets, a theater, a stadium, and at least one agora. The Library of Celsus, constructed from 114 to 135 CE, with a façade resembling a theater's *skene*, was decorated in a Hellenistic-Baroque revival style and adorned with numerous statues.

Pergamon: The center of power for the Attalid dynasty, Pergamon was gifted to the Romans in 138 BCE. An excellent example of the



Eastern Provinces of the Roman Empire, Archaeology of the, Fig. 2 Sites referenced in the text

development of Hellenistic architecture, Pergamon retained the majority of its structural character during the Roman period. Notable additions to the city include the Temple of Trajan and infrastructure such as baths and aqueducts. The theater was also remodeled in the Roman period.

Syria/Palestine

Antioch on the Orontes: Antioch is known to us primarily from literary sources and little remains of the ancient city. Sartre (2005: 163–165) lists no less than 25 imperial building projects in the city, including numerous baths, temples (some to the imperial cult), theaters, stadia, aqueducts, and arches. It was an extremely important city in terms of Roman administration of the East, serving as the capital of the province of Syria. Like Ephesos, it boasted a population estimated at 250,000 and later became an important center of the emerging Christian church.

Dura-Europos: Less monumental than Antioch, Dura-Europos was located on the eastern frontier of Syria. The Romans seized it from the Parthians in 165 CE, but in 265 the Parthian king Shapur I besieged the city and drove out the Romans. It was subsequently abandoned, and for this reason, it has become immensely significant archaeologically. Excavations have revealed a number of public and private buildings in the city, none more important than the preserved church, synagogue, and mithraeum. All three structures, located in close proximity, were adorned with figured frescoes and offer important insight into the character of these three religions in the third century CE. The synagogue frescoes are particularly fine and anticipate many developments later seen in Late Antique and Byzantine painting and sculpture (Dirven 1999; Chi and Heath 2011).

The Decapolis: A loose grouping of cities clustered near the modern confluence of Syria, Jordan, and Israel, the Decapolis figures prominently in the gospels. Included in the ancient designation were the excellently preserved cities of Beth Shean/Scythopolis, Gadara, Gerasa, Bostra, Amman/Philadelphia, and several others. These

cities, which had majority Greek populations, were affiliated culturally rather than politically. Indeed, they seem to have competed with one another for imperial attention, and their massive building programs intensified in anticipation of Hadrian's tour of the provinces. Consistent features in these cities include monumental colonnaded streets, agoras, theaters, hippodromes, nymphaea, and gateways, and indeed they have a certain uniformity about them (Segal 1997).

Herod's Judea: Herod the Great (74/3–4 BCE), one of the more complex figures from the Roman period, initiated a number of monumental building projects throughout Judea. These were intensely political structures, as Herod sought to placate his Jewish subjects while simultaneously currying favor with Augustus. On the one hand, he rebuilt the Temple of Solomon in Jerusalem in grand, lavish style. On the other, he constructed a monumental harbor named Sebaste (Greek for "Caesar") at Caesarea Maritima and built temples of Roma and Augustus throughout the region. He also built a number of remote palaces that integrated an architectural bravado with the best Roman engineering. The palace at Masada was built on the side of a cliff that at Caesarea projected out into the sea, and at Herodium, Herod built an artificial mountain that completely enclosed his palace. All of this was surely intended to create a positive impression among the Romans (Netzer and Laureys-Chachy 2008).

Palmyra: The best-preserved Roman city in the East is doubtless Palmyra, which became the major center of Roman trade in the second century CE. The seat of Zenobia's revolt in 269 CE, Palmyra was an extremely wealthy city and had an architectural program to match. It boasts the same typical features as other large Roman cities in the East, including colonnaded streets, an agora, a theater, a nymphaeum, baths, and a number of civic buildings (Browning 1979). All of these were lavishly constructed and decorated. What sets Palmyra apart from similar cities in the Decapolis is the nature of its religious buildings. There are three major temples that have been excavated at Palmyra, and all three evidence a clear fusion of Hellenistic/Roman and Semitic sacred architecture. Peristyle colonnades and Corinthian columns are combined with crenelations, rooftop shrines, and raised adyta. Several hundred funerary busts, both of men and women, also survive from Palmyra, grounded in the fashion of Roman funerary busts but with distinctive local characteristics (Heyn 2010). The art and architecture of Palmyra, like that at Baalbek, is therefore important to the consideration of religious syncretism and cultural integration in Rome's eastern provinces.

Petra: Capital of the Arabian kingdom of the Nabataeans, Petra was the major hub for the overland transport of the luxury aromatics frankincense and myrrh. Petra is most famous for the several hundred rock-cut tombs that adorn the cliff walls that surround the city center but also boasts several temples, a theater, a nymphaeum, an arch to Trajan, and a building (the Great Temple) that probably appropriated both religious and civic functions (Weber and Wenning 1997; Joukowsky 2009). Hillside mansions were decorated with wall paintings in Pompeian style. As is the case at Palmyra, Petra's architectural and artistic inconsistencies are evidence of the ongoing negotiations of identity that occurred during the Roman period. Ostensibly an independent kingdom until Trajan's annexation in 106 CE, the architecture of temples and tombs is characterized by the inconsistent coexistence of Hellenistic/Roman and Near Eastern elements. Depictions of the gods vary as well, with numerous aniconic betyls balanced by full busts of Greek deities.

Egypt

Alexandria: Second in size only to Rome, with an estimated population in the vicinity of 500,000 inhabitants in the Roman period, Alexandria was of critical importance to the Roman economy and administration of Egypt (Greene 1986: 28–30). Captured by Octavian following the Battle of Actium, the fabled city of Alexander was already a major economic, political, and scholastic center. Most of its antiquities have been destroyed, including the library and the lighthouse, but the Roman catacombs (Kom al-Shoqafa) are well preserved and offer insight into Romano-Egyptian funerary practices. A 30-m honorific column dating to the reign of Diocletian still

stands today, as does the theater. Although free-standing architecture in the city is otherwise lost, McKenzie (1990, 2007) has suggested that the wall paintings from Pompeii and certain tomb façades from Petra are representative of a particular Alexandrian style, characterized by heavy baroque embellishment.

The Fayoum: Augustus settled a large number of veterans in the Fayoum, a fertile area surrounding Lake Moeris, and a series of Romano-Egyptian towns sprung up there as result. Excavations at Karanis have revealed a large number of artifacts tied to daily life, as well as a wealth of documentary papyri. Studies of this material have allowed for detailed demographic studies on the population of Roman Egypt (Bagnall and Frier 1994). Numerous painted mummy portraits have also been recovered from the Fayoum (ancient *Crocodilopolis*); these serve as significant examples of ancient painted funerary portraiture. Whether they are generic or specific remains an open question (Riggs 2002).

Not everyone lived in large urban centers, of course. The landscape was dotted with smaller towns, villages, and farms, and the rural economy was of critical importance. Indeed, Rome herself relied on shipments of Egyptian grain. Regional surveys, hinterland studies, and excavations of small settlements have become increasingly common in recent years. Major research themes in these studies include the relationship between major urban centers and their surrounding hinterlands; the nature of frontiers, marginal zones, and rural economies; and the ethnic and cultural diversity of the region (see, e.g., Barker et al. 2007; Smith 2010).

The geographical and temporal extent of Rome's eastern provinces, coupled with the number of cultures and ethnicities it encompassed, has engendered several important academic debates. There is a series of general theoretical issues that arise from the intersection of cultures and of which the Roman East provides a number of excellent case studies. In addition, there are historical questions that tie specifically to the nature and development and maintenance of the Roman Empire. Finally, there are issues concerning the contemporary management and deployment of archaeological sites.

Theoretical Issues and Debates

Orientalism/Colonialism

Edward Said's 1978 monograph *Orientalism* gave voice to a growing discontent in scholarship regarding the remnants of colonialism in scholarly approaches to the Near East. Though not specifically directed at Roman archaeology, his points certainly exposed a widespread tendency to view the East from a decidedly Eurocentric perspective. The heavy-handed European involvement in the Middle East, especially during the first half of the twentieth century, reinforced ideas of Western political and ideological supremacy. New archaeology and processualist thinking contributed to this mode of thinking, as large states and empires were characterized as more evolved and civilized than "primitive" formations like nomadic tribal confederacies or chiefdoms. The very idea of the Roman East is problematic, as it reifies the region in Roman terms and through Roman eyes. Scholarship from the last three decades has labored to undo the legacies of colonialist thinking in regard to the Roman provinces, with more and more attention being paid to local contexts, cultures, and perspectives.

Biblical Archaeology

A major factor shaping the development of Roman archaeology in the eastern provinces is the entanglement of Rome with Jewish and Christian history. Herod the Great was a client king of Rome, and his monumental building projects resulted directly from his engagement with Antony and Augustus. The nativity of Christ is dated to the final year of Herod's life (4 BCE), and his ministry, trial, and crucifixion took place under the administration of the famous procurator Pontius Pilate. The First and Second Jewish Revolts pitted Jewish partisans and Zealots against Roman troops, and the archaeological evidence for the wars is plentiful. In the fourth century CE, Constantine the Great, the first Christian Roman emperor, established a series of monumental churches in Palestine, developing the Holy Land as part of campaign to increase the visibility and stature of Christianity (Parker 1999). Indeed, Biblical archaeology can be said to begin with the explorations of Constantine's

mother, Saint Helena (patron saint of archaeologists), who journeyed to Palestine and discovered the relics of the True Cross.

As much early, Greek archaeology was tied to elucidating the historical background of Homer, so too has the history of archaeological research in Palestine been tied to sites, events, and people of the Bible. Many of the early archaeologists working in the Holy Land were devoutly religious and saw archaeology as an opportunity to illuminate, if not validate, the historicity of the Bible. W.F. Albright's legacy is emblematic; on the one hand, he is rightly praised for his groundbreaking work in clarifying stratigraphy and ceramic typologies, for applying rigorous scientific criteria, and for generally and substantially improving the professionalism of archaeological practice in the Near East, but on the other hand, his positivism, empiricism, and objectivity have all been called into question (Dever 1990, 1993).

Beginning in the 1960s and 1970s, Biblical archaeology proved divisive in academic circles, as several scholars attacked what they considered a methodology driven by ideology (Thompson 1974; Finkelstein 2007). It should be observed, however, that the majority of criticism against Biblical archaeology has been directed toward studies of early Israel and the narratives of the Old Testament. The Roman period is much better attested, both historically and archaeologically, and, with the exception of Masada (see below), also less entangled in narratives of the formation of Jewish identity and religion. Indeed, Roman-era Biblical archaeology has had a positive impact on the discipline of Roman archaeology, for the search for Jesus' historical context resulted in an emphasis on daily life in the countryside and greater consideration of everyday objects.

The huge popular interest in the archaeology of the Biblical world creates an appetite for sensationalism, and finds of debated pedigree (e.g., the Jesus Family Tomb, the James ossuary) are promoted with huge fanfare. Such media events tend to be surrounded by scholarly backlash and claims of fabrication.

Romanization

"Romanization" has been an important issue in Roman studies for two decades now, and several studies have illustrated that the spread of Roman imperialism did not elicit a wholesale adoption of Roman cultural practices (Woolf 1998; Webster 2001). To be sure, there is an observable general trend of incorporating Roman behavior and ideology, clearly demonstrable in the archaeological record via the widespread construction of baths, theaters, and temples dedicated to the imperial cult. At the same time, however, indications of the intentional maintenance of indigenous cultural practices are also evident, especially in areas of religion, art, and language (Millar 1987). The debate, therefore, centers on how best to understand the interaction between the powerful push of Roman culture and the deeply rooted traditions of Asia Minor, the Near East, and Egypt. Social stratification plays an especially important role in this regard, as the priorities and identities of the elite class often differed widely from those of the middle and lower classes. This interplay between subject and ruler is of paramount importance throughout Roman provincial archaeology, and the Roman East has provided a number of fruitful case studies.

Cultural Identity

Hellenistic and Roman expansion into the East resulted in dramatic political, cultural, and demographic changes. Cultural identities, both individual and collective, were necessarily called into question as new alignments and opportunities presented themselves. Intermarriages changed the ethnic makeup of the region, integration of new cults shifted traditional religious expressions, and provincial organization altered access to power and status. As a result, cultural identity was constantly negotiated and contested. Recent scholarship (Gruen 2011) explores the nuances of these shifting conceptions of self and group throughout the ancient Mediterranean; the multicultural character of the Roman East affords several excellent case studies.

Imitation/Acculturation

This intersection of cultures had a major impact on art and architecture. Long-standing traditions of visual expression, based largely on Mesopotamian, Persian, and Egyptian precedents, came under revision through exposure to Hellenistic and Roman

forms and motifs. In many cases, the general Semitic avoidance of graven images was relaxed; at Petra busts of gods began to appear alongside aniconic betyls, and Palmyrene gods were depicted in the garb of Roman soldiers. Roman architecture, indebted as it was to Hellenistic predecessors, dominated the urban landscape. Through triumphal arches, theaters, fountains, colonnaded streets, temples, statuary mosaics, etc., Rome left a lasting imprint on the visual culture of the East. The penetration of Roman art is seen throughout the region, and even small towns and villages often boasted imperial statue busts or colonnaded buildings. Nevertheless, scholars have taken pains to point out that this was not a simple case of imitation or assimilation, arguing rather that it resulted from a dynamic dialogue of incorporation and adaptation. Many Near Eastern motifs and expressions were often retained alongside Roman ones, and Egypt maintained an especially strong tie to its artistic heritage even as it drew on Roman forms.

Religious Syncretism The impact of Roman expansion is especially measurable in the environment of cult practice. Local or regional deities such as Baal or Dushares were regularly conflated with Greek and Roman gods like Zeus and Dionysus. Imperial patronage promoted the construction of sanctuaries dedicated to these divine pairings. The great complex at Baalbek, Lebanon, is the most expansive and well known of these cult centers, and the main temple was dedicated to the god Jupiter-Hadad. Architecturally, many temples in the East incorporate features from both Roman and Semitic practice; examples of the latter include stairs to rooftop platforms, enormous temenos courtyards, and raised lateral adyta. In Nabataean Arabia, several temples preserve raised central platforms that accommodate circumambulation, and the plan of these temples is distinctly non-Roman. At the sanctuary of Khirbet Tannur in Jordan, temples of this type were decorated with a sculpted zodiac frieze and reliefs of deities such as Helios and Tyche, illustrative of the much wider phenomenon. Zodiacs also found favor in synagogues of the fifth and sixth century CE, although the interpretation of these zodiacs in a Jewish context is much disputed (Magness 2005).

Key Historical Issues

Roman Imperial Strategy

The impetus for Roman expansion in the East and the character of its subsequent spread has sparked lively debate. The central issue is whether Roman expansion was essentially an ad hoc process, spurred by immediate fiscal and political concerns, or whether there was in fact a broader, far-reaching plan in effect. Using Roman Arabia as a case study, Freeman (1996) argued that wars, annexations, and the defining of provincial boundaries were essentially reactionary acts undertaken by an emperor under political or economic duress. Sipilä (2009) has countered in favor of a more logical, if not planned, approach to provincial administration, using qualitative comparison models to identify particular factors that played a key role in determining the outcome of imperial decision-making.

Roman Frontiers

Udruh, Lejjun, and Qasr Bshir are but a few of the large number of well-preserved Roman forts and watchtowers that dot the deserts of Syria, Jordan, and Saudi Arabia (Kennedy 2004). The forts were situated to the east of the main north/south artery in Transjordan, the Via *Traiana Nova*, and seem to have formed a loose but interconnected line. Known as the *limes Arabicus*, it is clear that the forts at very least marked the eastward extend of Roman expansion (Parker 1987). Some are large legionary fortresses; others are smaller *castra*. The function, administration, and organization of the forts changed through the empire; Diocletian invested especially heavily in the expansion and strengthening of the fortification system.

The question raised by these forts is whether they, like Hadrian's Wall, represented an actual boundary or border. Their practicality in suppressing raids has been disputed, given the distance of their spacing and the difficulty Roman soldiers would face in pursing nomads into the desert. The forts may have been as symbolic as they were functional, showing that Rome ruled even into the empty desolation of the desert.

Other Key Issues

Conservation and Cultural Heritage Management

The number of archaeological sites in the eastern provinces of the Roman Empire is staggering. As such, conservation is a critical issue in the region. Several important sites lie in the middle of large cities (e.g., Beirut, Jerusalem), and urban expansion places significant pressure on them. A far greater proportion of sites lie in remote areas, exposed with little protection from the elements. Looting is a major problem, especially in zones of economic and political turbulence. The resources and infrastructure required to oversee and manage sites are substantial, often exceeding government capabilities. Sustained international investment in heritage management is of critical importance.

In several regional countries, Departments of Antiquities are associated with or overseen by Ministries of Tourism. When the priorities of these agencies come into conflict, touristic development often has the upper hand. Given the economic importance of tourism, conservation emphasis continues to be placed on well-known sites that occupy typical tourist itineraries. In Jordan, for example, Jerash is the focus of considerable development, including a handicraft bazaar at the entrance to the site, reenacted gladiator fights, and chariot races. However, sites off the major tourist routes are not afforded the same degree of investment nor protection. This problem is not confined to Jordan, of course – the same can be seen in every country in the region (Brodie et al. 2006).

One area of recent progress in cultural heritage management is the development of national databases and registries for archaeological sites. The Getty Conservation Institute and the World Monuments Fund recently sponsored the creation of the Middle East Geodatabase for Antiquities, or MEGA. Intended for use throughout the Middle East, it is currently being piloted in Jordan. The geodatabase tracks sites across the country, their preservation status, and threat levels. The Israel Antiquities Authority has a similar in-house system, and others are in use or in development in other regional countries.

Politics and Archaeology

The archaeology of Rome's eastern provinces is deeply entangled in national and regional political discourses. The picturesque ruins draw large numbers of visitors, and the economies of several Middle Eastern countries depend heavily on tourism. Roman period remains tend to survive better than those from earlier periods, thanks to the widespread use of monumental stone architecture. As a result, it is the colonnades and crumbling façades of the temples, aqueducts, and for a that leave their stamp on the public imagination. Antiquity is a regular part of political discourse, as the monumental legacy of the past is stirred to legitimize current policies or rulers (Meskell 1998). Saddam Hussein and the Shah of Iran actively promoted themselves as heirs to the great empires of the past, and such linkages are also seen in several current contexts. It is very common, for example, for images of archaeological sites to grace coins and paper bills, often in conjunction with the face of the king or president. Utilizing past glories to promote current dynasties is nothing new nor is it isolated to the Eastern Mediterranean (cf. Mussolini and the Roman Empire, for example), but it is nevertheless widespread in the region.

Israel, Palestine, and Roman Archaeology

The most politically charged arena for the use and abuse of Roman archaeology is doubtless Israel and Palestine. Laying claim to heritage and ancestry is of critical importance to all parties contesting ownership of the land. Sites that give evidence of past presence and past legitimacy are taken as justification for current claims. Both Israeli and Palestinian politicians deploy antiquity as justification in their discourse, although Palestinians lean more toward either Bronze and Iron Age sites (Canaanite and Philistine) or Islamic sites. Roman sites, especially those tied to the First and Second Jewish Revolts against Rome, are more often used to illustrate Israeli rights and prerogatives.

The First Jewish Revolt of 66–73 CE was a bloody and protracted war. The Roman army, under the leadership of Titus and Vespasian, was heavy-handed in its suppression of the rebellion.

According to Josephus' account, Roman soldiers killed at least one million Jews during the course of the conflict. Josephus records some particularly gruesome sieges; the inhabitants of Yodfat, Gamla, and Jerusalem were said to have been executed en masse when their defenses finally fell. Most famous is the legend of the siege of Masada, the hilltop fortress built a century before by Herod the Great, which was the final rebel stronghold. As Flavius Josephus (*Bell. Iud.* 7.389–406) recounts, when the Romans finally broke through the defenses of the citadel, 960 of the 967 inhabitants had put one another to the sword, preferring death at their own hands to execution or enslavement by the Romans. Whatever the truth behind the text, the legacy of these sites has become embedded in the ideology of Israeli statehood and nationalism. The slogan "Masada shall not fall again," sworn by new soldiers in a ceremony at the site, has become synonymous with Israeli independence. Masada has become a symbol of defiance, resistance, and determination, even a pilgrimage site of sorts. Of all the Roman archaeological sites in the Middle East, Masada has the greatest political significance (Elon 1997). By creating such narratives of national identity, archaeology is inextricably entangled in the Israeli-Palestinian conflict, as it is a powerful way to legitimize ancestral claims to contested spaces (Abu el-Haj 2001; de Vries 2010). In addition, the current (2012) "Price Tag" campaign has had a direct impact on the archaeological record, as ultranationalist groups within Israel have vandalized several sites in retribution for government dismantling of illegal settlement outposts.

International Perspectives

Scholarly interest in the archaeology of the eastern provinces of the Roman Empire has increased dramatically in the United States and Europe in the past two decades. Work on the Roman East is becoming more and more common, and the wealth of material and visual culture in the East is transforming Roman studies. The multicultural nature of the region has raised the importance of cross-cultural analyses, as well as explorations of the mechanics of identity, the reception of Roman visual and material culture, and the administration of empire. Even as the East has become accepted as a mainstream part of Roman studies, however, it retains something of a foreign quality within the discipline. Even now, many of the large and well-preserved Roman sites in the Middle East, places like Umm Qais (Gadara), Umm el-Jimal, or even Herodium, are still relatively unknown by Romanists who do not work in the East. This likely owes to the different languages, religious practices, and cultural or artistic traditions of the inhabitants of the eastern provinces, which pose a barrier of entry for many scholars.

Future Directions

The most pressing archaeological needs in the eastern provinces are conservation and publication. Excavations remain important, of course, but given the number of sites under threat of looting or destruction, preservation should take precedence. Public information and education sources, especially ones that cross modern political boundaries, are also needed. Coordinated databases and websites will do much to make the massive swathe of the eastern provinces more manageable and accessible. Finally, the need to make archaeological sites meaningful and relevant to local inhabitants has been recognized as a critical priority.

Cross-References

- ▶ Aphrodisias, Archaeology of
- ▶ Dura-Europos, Archaeology of
- ▶ Ethnicity and Identity in the Ancient Mediterranean World
- ▶ Hellenistic and Roman Anatolia, Archaeology of
- ▶ Jerusalem (Hellenistic, Roman, and Late Antique), Archaeology of
- ▶ Post-Second Temple Judaism Archaeology
- ▶ Western Roman Provinces, Archaeology of the

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Echo-Hawk, Roger C.

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Basic Biographical Information

Historian, writer, and artist Roger Clay Echo-Hawk entered this world in Pawnee, Oklahoma, on September 15, 1954. Born to US Air Force boom operator Walter R. Echo-Hawk, Sr., and housewife Ruby J. Echo-Hawk, he is the youngest of four children. A citizen of the Pawnee nation, his indigenous American ancestors include three of the four autonomous Pawnee bands (Chaui, Kitkahahki, Skidi) and Buffalo Clan Otoe, while other ancestors came from England, France, Germany, Spain, and Switzerland. His youth was spent on Air Force bases throughout Missouri, Nebraska, North Dakota, and Puerto Rico, during which time he came to identify strongly with the ideals of the hippie movement. Writing, and poetry specifically, emerged as his primary interests in the late 1960s, with Richard Brautigan, Lord Dunsany, and J. R. R. Tolkien being especially influential. He took courses at the University of New Mexico but in 1973 moved to Boulder and attended the University of Colorado (CU) at the urging of his eldest brother, Walter, Jr. In 1975 he entered the new Creative Writing Program at CU but left a year later. Upon receiving training as a Heliarc welder, he worked for Beech Aircraft from 1978 to 1985. Echo-Hawk served for 11 years (1981–1992) as correspondent on Native American Affairs for the cultural and literary journal *Rolling Stock*, which was then edited by renowned poet and CU faculty member Ed Dorn. In 1989 he married software engineer Linda J. Ross, originally of Kansas City, Missouri, by which point he had returned to CU to study anthropology and history. He earned his bachelor's degree in history in 1990. Echo-Hawk's study of Pawnee history, focusing initially on the Echo-Hawk family, began in earnest in 1979 and resulted in his pursuing graduate work under Vine Deloria, Jr., Patricia Limerick, and Douglas Bamforth at CU. Echo-Hawk ultimately received his master's degree in history with an emphasis on ancient Indian history from CU under Philip J. Deloria in 1994. During the late 1980s, Echo-Hawk was affiliated with the Native American Rights Fund (NARF) through his brother Walter, Jr., and in his capacity as tribal historian, Echo-Hawk assisted his brother and served as a consultant on repatriation-related issues for NARF until 1995. These efforts resulted in the repatriation and reburial of many Pawnee ancestors held by the Nebraska State Historical Society and

Smithsonian Institution, as well as the passage of Nebraska bill LB-340, a precursor to the NAGPRA (Echo-Hawk and Echo-Hawk 1994). In the early 1990s, Echo-Hawk also worked occasionally as an archaeological survey crew member and site monitor. From 1995 to 2001, he served as repatriation coordinator for the Colorado Historical Society and the Denver Art Museum and was assistant curator in the Native Arts Department at the latter institution from 2001 to 2003. Echo-Hawk's extended reflection on repatriation (2002) precipitated his critique of race and racialism, the idea of race put into daily practice, and in 1998 he gave up his racial Indian identity entirely. Frequently contributing to the Closet Chickens online group, he is known as "Sweet & Sour Chicken," which is an apt metaphor for his prosodic missives that provide support for its members and incisive critique of the flock's use of race. A passionate thinker, generous, and kind of heart, Echo-Hawk today works as a writer and artist from his home in Longmont, Colorado, where he continues to interrogate dreams and challenge us to reject the racial status quo.

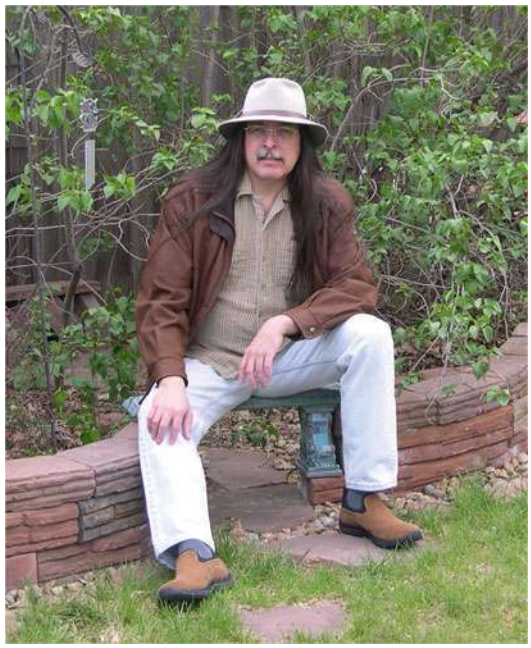
Major Accomplishments

Echo-Hawk's most significant contributions are his writings on the value of oral tradition to archaeology and critiques of race. His Master's thesis took an innovative approach to deep history by exploring connections between Pawnee oral tradition, ancestral populations, and archaeological data. The published version (2000) remains influential for presenting a method for treating oral traditions as evidentiary according to the NAGPRA. Stimulated by this and his work on repatriation, his focus shifted to race (2002), culminating in his book-length treatments (2010, 2011) and an exploration of racial thinking and elements of Pawnee mythology found in Tolkien's writings (2016). Reading Echo-Hawk is always rewarding but often challenging owing to the positions that he takes and a tendency for his terms and references to be highly recursive. Likely an intentional literary device, this style forces a close reading with attentiveness to word meaning and context, but it can be frustrating for casual readers. His writings, which are often very personal, probe connections between dreams, the past, and the present (2016, 2017) and underscore the lived experience of race, and ideas are sometimes presented in the form of Socratic debate in which he adopts different personae (Dongoske and Zimmerman 2010; Echo-Hawk and Zimmerman 2006). Echo-Hawk's (2010) account of his graduate training highlights academics' general unwillingness to support young scholars interested in developing innovative methodologies to bridge archaeology and oral tradition, specifically, and more generally to ask different questions with value to readers beyond the profession. He thus exemplifies the structural problem that persists today for many Indians studying history, anthropology, and archaeology.

Echo-Hawk's ruminations on race make several key points: (1) race is a discredited pseudoscientific concept that should be wholly rejected, (2) ethnicity should replace race because it is grounded in culture and abandons illusions of race as justification for oppression, and (3) race is too rarely addressed in archaeological discourse, and academics have a responsibility to rethink race studies more broadly. From his discussions, we learn that understanding race as a cultural invention is not simply about fighting racism but altogether abandoning race as a concept and investigating the behaviors that perpetuate it at an individual, subjective level. To do so requires analysis of intersecting and overlapping social identity markers such as ethnicity and nationality.

Echo-Hawk's critics variously point to a lack of empirical data to support some of his assertions and argue that he conflates race, culture, and ethnicity. Substituting ethnicity for race, for example, runs the risk of neglecting race as a central social, political, and historical category with direct links to contemporary inequalities and also sidesteps the fact that many Indians are binational. Indian nations, like all nations, deploy intersecting racial and ethnic ideologies with homogenizing effects. While it is debatable whether Echo-Hawk truly conflates race and ethnicity, it is clear that both concepts lack specificity in public discourse, which only complicates one's ability to understand the rationale or position that an individual

is speaking from when they invoke a multivalent label such as "Indian." Because not everyone self-identifies with a racial or ethnic identity, it is often difficult to be sure whether someone is deploying one or the other. Notably, critics of indigenous and decolonized archaeologies often misread his criticism of race as a mainstay of these programs as opposition. However, close reading shows that he supports their goals but prefers that they develop strategies that do not rely on explicit or implicit assumptions of dehumanizing racial ideologies. His writings caution that the repatriation movement's invocation of race runs the risk of failing to challenge essentializing discourse about identity and instead merely shift power to a new author and narrative. Echo-Hawk's overarching goal is to "spark communal discourse on the problem of race, rather than unilaterally craft solutions, believing that solutions should follow most naturally from social dialog" (Fig. 1) (*pers. comm.* 1/10/2012).



Echo-Hawk, Roger C., Fig. 1 Roger Echo-Hawk, at home on the far western edge of the ancient Pawnee homeland, north of the Mountain That Touches the Sky. (Photo by Linda Echo-Hawk, May 2008)

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École française de Rome

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Basic Information

The École française de Rome, founded in 1873, is an offshoot of the École française d'Athènes (founded in 1846), which became fully independent in 1875. It is a research institution, located in Rome's Palazzo Farnese, which devotes its work to history, archaeology, and the social sciences. The school is administered by a director (currently Professor Catherine Virlouvet) and three research

supervisors, respectively in charge of Antiquity (currently Nicolas Laubry), the Middle Ages (currently Pierre Savy), and the moderne and contemporary periods (currently Fabrice Jesné). It hosts 18 members, doctoral or postdoctoral students, for a period of 3 years, as well as research associates and scholarship holders, for a fixed period, and has an archaeology laboratory on the grounds of the *Crypta Balbi* in Rome. The field of operation of the school includes Italy, the Maghreb, and the countries bordering the Adriatic Sea (including Croatia and Albania). Its research findings are published in three scientific reviews (*Mélanges de l'École française de Rome – Antiquité/Moyen Âge/Epoque moderne et contemporaine*), as well as in the form of monographs in several collections (including *Bibliothèque des Écoles françaises d'Athènes et de Rome*). The school also maintains a rich library collection with more than 180,000 volumes, including 2000 periodicals for consultation.

Major Impact

Since its early years, under the leadership of its director Auguste Geffroy (1820–1895), members of l'École française de Rome have dedicated themselves to the reassembling of inscriptions in Central Italy and to the study of archaeological sites and remains. Emmanuel Fernique was thus one of the first to gather inscriptions from the territory of the Marsi (Italic people centered at Marruvium on the Fucine Lake), to study the Capua's museum collections (1874), the remains of Praeneste (1880), and finally to conduct surveys in the Praenestine countryside. Right after him, René de La Blanchère dedicated himself to the study of remains in Terracina and the Pontine Marshes, while in 1889, Stéphane Gsell (1864–1932) excavated a portion of the Etruscan necropolis of Vulci on the estate of the Torlonia family. Soon after, Albert Grenier (1878–1961) dedicated himself to a large study of Villanovan and Etruscan cultures in Bologna.

After the establishment of the French protectorate over Tunisia in 1881, the members of the École française de Rome began to shift their archaeological activity toward North Africa. La Blanchère inaugurated the Department of Antiquities of Tunisia and opened the Bardo Museum in Tunis in 1888. In 1890–1891, Jacques Toutain dedicated his work to the worship of Saturn and Auguste Audollent (1864–1943) gathered inscriptions from the region of Constantine in Algeria. In 1893, Henri Graillot discovered some unprecedented monuments in the vicinity of Timgad and Khenchela, before Stéphane Gsell devoted himself to the study of the region and wrote his monumental book (Gsell 1893). In addition to these historical and epigraphic studies, the members of the EFR conducted research operations in North Africa, such as in 1897 Maurice Besnier in the Lambèse camp, Léon Homo and Alfred Merlin in Dougga from 1899, Jacques Zeiller in Thignica in 1906, and Jacques Heurgon and Jean Lassus in Tipaza. This activity in North Africa has continued to this day, especially with the excavations of the hill of Byrsa in Carthage, of Sufetula, of Bulla Regia, of Cherchell, of Volubilis, of the necropolis of Pupput (Ben Abed-Ben Khader and Griesheimer 2004), of the thermal complex and monumental hill of Jebel Oust, and of the settlement of Sidi Jdidi (Ben Abed-Ben Khader et al. 2004; Fixot 2011).

In Italy itself, it was after the Second World War that the archaeological activity conducted by foreign institutes resumed. From 1946, Raymond Bloch (1914–1997) directed the excavation of the city of Bolsena, which led to the discovery of the forum and adjacent dwellings (Bloch 1972). From 1949, under the direction of François Villard and Georges Vallet, the excavation of the Megarian colony of Megara Hyblaea began, on the eastern coast of Sicily, which lasted up until 1992 (Vallet et al. 1983–); the excavation resumed in 2006 under the direction of Henri Tréziny. In subsequent years, the EFR launched numerous research projects in Italy. These included excavations at Rome on the Pincian Hill (1982–2005) and the Palatine Hill (1985–1998), a resumed excavation of the river port of Aquileia (1991–2005), and excavation of the Lucanian site of Civita di Tricarico in Basilicata and of the Greek and Lucanian city of Poseidonia/Paestum. In Etruria, the EFR has investigated Musarna, a purported colony of

the city of Tarquinia, and its necropolis. The EFR has also participated in the excavation of the Celto-Etruscan necropolis of Monterenzio Vecchio (2000–2005), as well as in projects in the Balkans (Sirmium, Salone, Caričin Grad).

Currently, the École française de Rome is continuing its archaeological activity in Italy. This includes work on pre-Roman populations, for example, excavation and survey at the fortified settlements of the Vestini and Paelignians in the Abruzzo region. The EFR is also carrying out projects focused on the Roman period, including study of the remains of the Domitianic stadium known as the *Circus Agonalis* (the present Piazza Navona in Rome) and excavations of the Loron villa in Croatia, of the township of Kouass in Morocco, of the catacombs of Saints Peter and Marcellinus in Rome, and of the Vigna Barberini on the Palatine Hill in Rome (Villedieu 1997–2007). Additional fieldwork has been carried out at Pompeii with the investigation of ancient bakeries and geophysical and paleoenvironmental studies at Portus with the collection of core samples and the study of the warehouses of Trajan. Medieval archaeology has been investigated at Sabra al-Mansuriya in Tunisia, in the baths of Cefalà Diana in Sicily, and at the cemetery and dwelling of Lezha in Albania. In a collaboration with the EFA, L'École française de Rome is also involved in the excavation of the Greek city of Apollonia in Illyria (Albania) and in excavation of Paleolithic sites in Valle Giumentina and Atella.

The Jean Bérard Center in Naples (http://www.centre-jean-berard.cnrs.fr/), which is involved in joint research with the CNRS and the Ecole française de Rome, is also organizing archaeological research, particularly in the necropolis of Cumae, at Pompeii and Herculaneum in Campania, and in Laos, in Calabria, and in Arpi, in Puglia.

Thus, for more than 140 years, the École française de Rome has been a major player in archaeological research in the western Mediterranean region. Currently, it aims to strengthen its partnerships with international teams and to be ever more open to the contribution of archaeometry and related disciplines, with the aim to enhance over the long term (from prehistory to the end of the Middle Ages) an understanding of ancient societies of the Mediterranean basin, while contributing to the research training of young archaeologists and widely disseminating its findings in publications or on its website (www.efrome.it).

Cross-References

- ▶ American Academy in Rome
- ▶ Archaeology and Anthropology
- ▶ Architecture, Roman
- ▶ Archival Research and Historical Archaeology
- ▶ Central Italy: Pre-Roman and Archaic Ceramics
- ▶ Ceramics, Ancient Greek
- ▶ Ceramics, Roman Imperial
- ▶ Ceramics: Roman Republican and Early Principate
- ▶ Deutsches Archäologisches Institut (DAI), Rome Department
- ▶ Economy, Roman
- ▶ Epigraphy, Imperial Latin
- ▶ Epigraphy, Latin: Early Through Late Republican
- ▶ Italy: Medieval Archaeology
- ▶ Latium Vetus, Latium Adjectum
- ▶ North Africa, Roman
- ▶ North Africa: Historical Archaeology
- ▶ Numismatics, Roman Imperial
- ▶ Numismatics, Roman Republican
- ▶ Religion, Italo-Roman, Archaeology of
- ▶ Survey Archaeology in the Roman World

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Economic Valuation of Heritage

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Introduction

The "value" of heritage has long been the subject of a discourse among academics engaged with heritage resources (Lafrenz Samuels 2008), primarily either from a situational context (which sites are "significant" and therefore valuable) or from an anthropological perspective (what is the source of "value" to begin with?). That there is value in the stock of tangible, intangible, and built heritage, together referred to as heritage resources in this entry, has been uncontested. This is true even though there is disagreement over what constitutes "heritage," over which heritage matters, and over whom should be authorized to decide those matters, and despite the reality that these values themselves can be highly subjective.

In recent decades, however, heritage has come to play a significant role in economic life, largely through economic value created through global tourism and the regeneration of historic urban centers. The resulting high level of public and private spending has made the "value" of heritage a natural subject for economists. Creating justifications for that spending and providing a basis for choices about which heritage resources should be preserved and presented to the public are natural and conventional applications of economic theories and methods. Inevitably, the "commodification" implied in the economic valuation of heritage resources has been challenged on ethical and philosophical grounds. Nonetheless, funding pressures introduced by government austerity programs, changing perspectives in the philanthropic community, and the sheer increase in demand for support of heritage resources driven by tourism and urban renewal keep economic considerations at the center of debates around heritage. Therefore, it is important to explore critically the theories, methods, and limitations of economics as they are applied to the valuation of heritage resources.

Definition

To an economist, heritage resources are merely goods or services consumed by members of society, albeit resources that have multiple, often intangible valences giving rise to an array of valuation categories (Klamer 2014; Throsby 2001, chapter 2). At the most abstract level, economists distinguish between the "instrumental" and the "intrinsic" values of heritage. Instrumental values include "use" values, derived from market-based measures or proxies, that emulate prices individuals or societies would be willing to pay to consume heritage goods and services. Use values include "actual use," the monetary value consumers would pay, for example, to visit a museum or archaeological site or to acquire and restore an historic property. Use values also include "option" values, the monetary amount consumers may be willing to pay in order to preserve the opportunity for themselves to visit a place in the future, and "bequest" values, amounts they would pay to ensure that future generations may visit even if they themselves cannot. Instrumental values also include "passive" or "nonuse" values, such as monetary amounts consumers or societies may be willing to pay to preserve a heritage resource that they or their progeny may never use, its "existence value." Finally, instrumental values also include amounts the public at large would

be willing to pay to ensure that the beneficial "externalities" of a heritage resource are available even if its use values are insufficient to justify sustaining it. Externalities, in economics, are consequences of economic activity that markets do not properly restrict or supply. Pollution is an example of a negative externality. The benefits in socialization and personal well-being that accrue when citizens visit museums, or the contribution to the collective stock of knowledge when archaeological sites are explored, illustrate positive externalities. The positive externalities of heritage resources are a central justification used by economists to declare them "public" or "merit" goods that deserve, and indeed must have, some form of public support.

Economists also acknowledge the "intrinsic" values of heritage resources. These include such characteristics as the aesthetic value of sites and objects; their spiritual value to communities of faith; their value as historical, social, or cultural symbols; or their uniqueness and authenticity as exemplars of past or present cultural accomplishments. Economists do not assert that intrinsic values can be measured directly in monetary terms. They would argue that some valuation techniques can capture proxies for those values, enabling intrinsic and instrumental values to be melded into a comprehensive perspective on the "benefits" of heritage resources. The measurement of heritage "benefits" is important to economists because their primary decision rule for determining the economic merit of a good or service is whether its private or social benefits exceed the costs to produce and deliver it (Brent 2017). In cultural terms, this suggests that the instrumental and intrinsic values ascribed to, for example, museums or archaeological research and site preservation, should exceed the costs to produce and deliver those places, goods, and services to the public. The challenge, as is obvious, is to find ways to quantify these benefits – in monetary or other terms – so that a benefit/cost calculation can be performed.

Historical Background

Markets for products of artists and artisans have existed since time immemorial, and important religious, social, and political monuments and structures have been erected, maintained, and conserved for centuries by the societies that built them. Until recent times, however, once those monuments or structures fell into disuse, their social and cultural value eroded, and they themselves were abandoned. In Europe, this only began to change in the fifteenth and sixteenth centuries in the wake of the scavenging of Rome's forum and other sites for marble to build St. Peter's Basilica and other church monuments (Stubbs 2009, chapter 13). By the eighteenth century in Europe, however, consciousness that the residue of the past had some resonance in the present gave rise to debates about whether, and how, to conserve or display heritage resources. Nineteenth-century debates between William Morris and Eugene Viollet-le-Duc about the proper management of ancient buildings carried forward to Alois Riegl's early twentieth-century articulation of the instrumental and intrinsic values of monumental heritage. They echo today in the scholarly discourse around the distinction between the scientific significance and the social or economic value of heritage resources. This long period of debate over significance, value, and preservation coincided with the growth of public museums, national archaeological services, and state-driven initiatives to explore, preserve, and present heritage resources. The justification for those activities rested heavily on their intrinsic value or on perceived beneficial externalities – such as preparing the emerging middle and working classes to participate in political society – that justified investing public and private resources in heritage. During the period of Europe's colonial expansion, European concerns for preservation and conservation were exported through legislation and practice to much of the colonized world.

Within the field of economics, concern with the value of heritage resources has more recent roots. Until the mid-twentieth century, economic theory largely presumed that markets, if left largely unfettered, would deliver the quantities of good and services required by society. The government's role was limited to activities such as the raising of armies and some clear public needs, such as sanitation systems and roads. This

changed in the 1950s when Samuelson articulated the economic argument for "public goods," followed shortly by Musgrave's description of "merit goods." Both concepts endorse government intervention to provide services and goods that, due to "market failures," otherwise will be provided in quantities short of public desires. The ensuing literature on public finance and the role of government in providing and protecting public goods, including heritage resources (Mazzanti 2002), is vast. The public good rationale became a rallying cry for heritage advocates, who called for government support of archaeological research and exploration, historical site and museum presentation, and artifact preservation and conservation. In much of the world today, with the prominent exceptions of the United States and the United Kingdom, members of the public and heritage practitioners largely accept the view that these activities are a primary responsibility of public bodies and should be funded with public resources (Frey 2011).

Tourism also has generated interest by economists in heritage resources. More than one billion people travel internationally each year, and billions more travel domestically. Heritage resources drive much of that travel. Tourism's benefits include business investments to support tourist visitation; jobs, income, and profits generated in the tourist trade; and foreign exchange earnings and tax revenues delivered to governments. In countries where tourism has become a major source of economic activity, and today this encompasses much of the world, the economic contribution made by heritage tourism further encourages government intervention.

Political support for heritage resources has resulted in substantial commitments of tax and other government revenues. In many countries, the heritage sector itself is almost totally dependent on government funding and thus constitutes a significant drain on public resources. This is a serious issue in a time of aging populations, a global drive to eradicate poverty, growing military spending, and rising health-care and educational needs. After government finances were sent reeling in many countries by the austerity regimes imposed in the aftermath of the Great Recession of 2007–2009, the consensus around financing heritage resources has come under pressure. The competition for scarce government resources requires decisions on how much money to devote to the sector, which elements of the national patrimony should be explored or conserved, and which cannot be preserved. Economists worry whether the intrinsic or instrumental benefits of heritage-related programs exceed the direct costs in government spending and the costs to businesses and individuals of regulations designed to protect heritage resources. In other words, the justification for spending on heritage resource-related education, research, conservation and presentation is no longer a foregone conclusion.

The challenge is that no clear consensus exists on how to measure either the instrumental or the intrinsic benefits of the heritage sector. In an era that emphasizes evidence-based spending by both governments and philanthropists, the lack of clear measures of the benefits of heritage resources means heritage-related spending is at a continuing disadvantage compared to education, health care, and other fields where both metrics and methods are far better developed. These realities have given rise to interest in using economic techniques to quantify the benefits of heritage resources and so to make the case that heritage-driven benefits exceed the private and public costs of generating them, thus justifying continued government and philanthropic funding.

Key Issues/Current Debates

Economists have developed a range of techniques for quantifying the value of nonmarket resources, including heritage resources (Champ et al. 2017; Snowball 2008). Three issues arise from the application of those techniques in the heritage field. The first is to understand the methodologies, and their limitations, involved in each technique for monetizing those values and to recognize appropriate and inappropriate uses of each approach. The second is to acknowledge generalized practical and technical issues that affect any effort to place an economic value on heritage resources. The third is to recognize that non-monetary

approaches to defining value exist but entail conceptual, technical, and practical issues of their own.

Valuation of nonmarket resources has become a central activity of both cultural and environmental economists due to the recognition that the resources they study are scarce, even unique and irreplaceable, and thus unlikely to be correctly allocated through market mechanisms. As a result, political pressure groups can play an outsized role in government budget and regulatory agencies, leading to policies that may either fail to protect heritage resources or do so at unnecessary costs in terms of actual outlays or regulatory burdens placed on the private sector. Underlying the discourse is the economists' principle of efficiency, which requires that any good or service, including a public good, should be provided at the lowest possible cost, measured either in funds expended or other resources used. For any particular policy objective, economists further argue that before adopting a policy, it is essential to ensure that more cost-effective alternatives to achieving the goal do not exist. In other words, benefits must exceed costs, and the lowest cost solution should prevail. Costs are straightforward, generally. The challenge is to identify feasible methods to measure benefits. Broadly speaking, there are three categories of techniques used to measure economic benefits: economic impact analysis, revealed preference techniques, and stated preference techniques.

Economic Impact Studies

Economic impact studies (Crompton et al. 2001; Snowball 2008, chapters 2 and 3) seek to measure the macroeconomic benefits of investments made in local or national economies. They do not capture, either directly or indirectly, the intrinsic benefits of heritage resources. Rather, they attempt to estimate concrete consequences of heritage activities measured by changes to the macroeconomy (gross domestic product, or GDP), employment levels, and government revenues. Such studies are conducted using econometric "input-output" models of the economy that endeavor to capture the interrelationships among the productive and consuming sectors of the economy. Thus, as a simple example, tourists visiting a foreign country to explore archaeological sites purchase airline tickets, local transportation, hotel rooms, meals, and souvenirs. These are so-called "direct" effects. Those purchases trigger payments, known as "indirect" effects, to the employees and vendors supporting tourist hotels, restaurants, shops, and so forth. The recipients of indirect payments in turn pay their own employees and vendors or buy food, pay rent, and otherwise consume goods and services, creating a third category of "induced" effects from this infusion of funds into an economy.

These three effects are known to economists as the direct, indirect, and induced "multiplier" effects of an injection of money into an economy. Such effects can occur at the national level when tourists enter from abroad or at the local level when funds from outside the area are infused into a local economy through, for example, domestic travel to visit a museum or outside funding for conservation work on an archaeological site. Economic impact studies are widely used in Europe and the United States to justify investments in heritage resources because they attempt to demonstrate the increase in local or national economic activity attributable to particular heritage-related activities (CHCfE 2015; Gangloff 2014; Oxford Economics 2016). Governments use these studies to prove to voters that there is a payback on investments in the sector, while cultural organizations use them to argue for government or private support based on the job-creating or tax revenue-generating potential of investments in heritage.

Impact studies come with numerous caveats (Crompton 2006). The most important is that the multiplier effect only occurs if the new funds are injected from outside of the economic region under analysis. Foreign tourists can lift the domestic economy, but domestic tourists are simply spending their money on heritage rather than on something else, resulting in no net economic gain. The input-output models of the economy themselves also are at best approximations of the real economic outcomes. The economic data used to generate the models is collected at an industry level, making precise estimates of specific

impacts virtually impossible. Moreover, all economies have "leakages" – funds spent outside of the local economy that offset the positive multiplier impact of infusions from elsewhere. The positive impacts of tourism, for example, may be offset by the need to import foreign goods or services or to remit profits to foreign hotel groups and similar organizations. Though measurable to some degree within input/output models, leakages are an inevitable offset to the positive economic impact of heritage tourism or investments in heritage sites. The problem of measuring leakages becomes most acute when impact studies are done at the local level, where the models and multipliers are least reliable. Frequently, however, the shortcomings of impact analyses are ignored by governments and private organizations eager to use them to justify investments that are politically desirable, if economically questionable.

Revealed Preference Studies

Revealed preference studies attempt to extrapolate from the actual behavior of economic actors – consumers or investors, primarily – in order to evaluate the economic contribution of particular heritage sites or interventions. There are two broad categories of revealed preference studies, hedonic pricing and travel cost analyses, each of which has distinctive uses and limitations.

Hedonic pricing studies distinguish the key characteristics of an economic resource and attempt to identify the contribution each characteristic makes to the ultimate market value of that resource (Baranzini et al. 2008, Introduction). In the heritage field, these studies are used primarily in urban contexts, where historic preservation of important buildings, the designation of historic districts, or the establishment of cultural centers (e.g., museums) are important elements of public policy (Lazrak et al. 2014). Hedonic pricing studies draw upon public records to identify the characteristics of properties in or adjacent to areas with heritage interventions and then accumulate property values from records of property sales over time or from government tax records that indicate changes in appraised value. Typically, these studies involve large databases charting the history of property transactions or tax assessments and require sophisticated econometric analysis to generate meaningful results. Such studies can impute an economic contribution to heritage-related investments or regulations by comparing changes in property values over time attributable to interventions related to heritage or by comparing the property value trajectory over time of otherwise similar districts of the city, only one of which has had a heritage-related intervention.

There are numerous technical challenges in constructing hedonic studies, and the findings of such studies are impossible to extrapolate beyond the specific location in which the study was conducted. The value of any property reflects both its use values, such as the rental value of an office building or home; its intrinsic values, such as its aesthetic or historic qualities; and external considerations, such as neighborhood ambiance and amenities, safety, proximity to transportation or recreational services, school quality, lifestyle choices, and similar factors. Thus, historic preservation may be associated with increases in real estate value in a region, but heritage values are imbricated with other economic and noneconomic considerations in a manner that makes it challenging to disentangle the effects. The urban regions studied may have arbitrary borders, and the data itself is laborious to collect and can be distorted if there are not frequent property transactions or tax reassessments. Perhaps unsurprisingly, conclusions from the hedonic pricing literature about the value resulting from urban heritage redevelopment vary from positive to negative depending on the study. Furthermore, the physical resurrection of urban neighborhoods often is accompanied by a process of gentrification in which impoverished original residents are gradually pushed out of the community in favor of those who can afford the rising costs of housing and property taxes. The social and economic costs of gentrification are never captured in hedonic pricing studies.

The second revealed preference method is the travel cost study (Parsons 2017). Generally, economists view the amounts that tourists are willing to spend on a heritage-related trip as a measure of the use value they place on their experience. Travel cost studies accumulate data on the spending by visitors for a site – both out of pocket costs,

such as airfares, gasoline purchases, entrance fees, and the like, and "opportunity costs" such as income tourists could earn by working rather than visiting a heritage site. By accumulating the amounts paid by a sample of tourists that visit a site, large databases can be assembled that, when subjected to econometric analysis, yield estimates of average amounts travelers pay to visit a site and the distribution of those amounts. By projecting those values to the entire attendance at a site, travel cost studies can be used to estimate their value to the public on a basis that can be compared to the cost to run the site (Melstrom 2014). Such studies also are subject to numerous limitations. Determining which costs to include in the study requires judgments. The data used in travel cost studies are extremely difficult to acquire and frequently must be based on visitors' memories or on the analyst's estimates. Free or nearby venues may be undervalued relative to those that charge admission or are far away from visitors' homes, while trips involving multiple venues may overvalue individual sites. Finally, the intrinsic values of a site are impossible to capture independently in a travel cost study, even though historical, spiritual, or educational importance may be the actual motivation for the trip.

Stated Preference

Revealed preference methodologies attempt to infer the value placed on heritage resources from the spending behavior of real estate buyers or travelers – a "count what I do, not what I say" approach to valuation. Stated preference techniques take the opposite tack, asking specifically for responses to value questions while taking due care to avoid the consequences of misleading statements. There are two basic stated preference approaches. One, choice modeling, seeks only to rank preferences among choices offered in the study. The other, contingent valuation (CV), takes a further step and attempts to understand actual amounts interviewees would be willing to pay for some specific activity related to heritage. Each will be considered in turn.

Choice modeling, as the name implies, involves presenting interviewees with a range of optional actions or situations and asking them to express their preferences for one versus another (Hanley et al. 2008; Snowball 2008, chapter 6). In the simplest form, this could merely involve asking a relevant group to rank-order a set of policy options relating, for example, to potential structures of admission fees and services offered at an archaeological site. The result would not be an expression of value in monetary terms, but it would generate a relative ranking of preferences that can guide decision-making. Such simple formulations of choice modeling, however, would be subject to objections relating to method and interpretation. Therefore, robust choice modeling experiments tend to present options in various combinations or otherwise test interviewees' priorities by offering a range of scenarios designed to flush out either contradictory sentiments or misleading responses. Using econometric techniques to analyze the resulting data, economists can produce rankings of preferences with a suitable degree of statistical precision. In heritage, such studies can be useful to identify preferences among either visitors or experts for policy choices in areas as diverse as the selection of conservation strategies or the selection among ancillary services available to museum visitors. Design of the study – the selection of options, the survey questionnaire, and the sampling technique – is critical to the integrity of the results. Moreover, choice modeling is not suitable for a study seeking to value an activity or a place in monetary terms.

Contingent valuation studies (Snowball 2008, chapters 4 and 5) have been developed to attempt to achieve that goal. In essence, a CV study seeks to understand consumers' willingness to pay for a specified outcome through direct questioning. This method can, if properly designed, yield an estimate of the demand curve for that outcome. There are three types of CV studies: "willingness to pay" studies, which ask how much an individual would be willing to pay in money to obtain something; "willingness to avoid" studies that ask how much an individual would be willing to pay to prevent something from occurring; and "willingness to accept" studies that ask how much an individual would be willing to be paid in order to accept an otherwise undesirable outcome. CV methods were deployed most prominently in the

wake of the Exxon Valdez shipwreck and oil leak in Prince William Sound, Alaska, in 1989. The results of a CV study of that accident were used to determine the amount of damages to be paid by Exxon for loss of local residents' use of the beaches, environmental damage, and wildlife losses. Subsequently, CV studies have been used to evaluate myriad environmental and heritage-related scenarios.

The Exxon Valdez case led the National Oceanic and Atmospheric Administration (NOAA) in the United States to commission a study by prominent economists that codified the essential elements of a credible CV analysis (Arrow et al. 1993). Among the key conclusions was that analysts should use willingness to pay, not willingness to avoid or accept, studies because behavioral economists have determined the former will yield a more conservative price estimate. Essential to CV studies is that each interviewee be presented with a clear scenario on which to base a response (hence the idea that the valuation is "contingent" on the scenario presented). Further, the NOAA panel stipulated numerous methodological details required if the study is to sidestep confusions arising from ambiguous questions or statistical bias. Sophisticated econometric and statistical analysis often is required to reach conclusions. CV studies are subject to numerous biases, including respondents' observed tendencies to overweight risky scenarios (e.g., events to avoid), to give interviewers the answer they believe is desired ("warm glow" effect), or to respond with extreme views ("protest bids") (Cuccia 2011). Nonetheless, properly conducted CV studies do offer policy makers a means to measure the public's monetary valuation of heritage.

Economic Value vs. Heritage Value

The economists' methods recounted here are limited in their application. Hedonic pricing studies are most valuable in urban regeneration and are not believed to capture effectively nonuse or intrinsic values of historic properties. Economic impact analyses usually are applied to demonstrate the contributions to employment, incomes, and tax revenues that accrue from tourist activities, from attendance at specific cultural institutions, or from proposed spending on capital projects. Aside from their vulnerability to political abuse, GDP impact studies do not capture instrumental or intrinsic values of heritage resources, only the impact on macroeconomic variables. Choice models deliver only relative valuations, not absolute monetary valuations, and so are ill-suited to policy decisions requiring benefit/cost assessments. Contingent valuation and travel cost studies are deployed to address a broad range of policy questions. A consumer's willingness to pay, expressed in either type of study, may reflect both the respondent's instrumental and intrinsic values for the place. However, travel cost studies are subject to so many qualifications that the results cannot be considered definitive. Citing the NOAA panel's conclusions, Snowball (2008, 78) argues that only contingent valuation studies are capable of reflecting, through the consumer's declared willingness to pay to preserve or avoid destruction, both the instrumental (use and nonuse) and the intrinsic values of heritage resources. Yet, even CV methods yield only a single monetary metric for the diverse values of heritage resources. Thus, no economic method today resolves the need to delineate and monetize separately the instrumental values of heritage resources – those most appropriately reducible to financial assessment – from the intangible intrinsic values and benefits of heritage that animate both professionals and broad swathes of the public.

Future Directions

In the face of expanding pressures on government and philanthropic funding for heritage and archaeological exploration and in an evidence-based era where quantifying benefits is central to policy makers' willingness to dedicate funding, there remains much work to be done to demonstrate that the benefits – instrumental and intrinsic – of heritage resources warrant the costs incurred by those who fund them. In particular, evidence-based policy analysis has come to dominate policy design in the sciences and health policy and in social policy realms such as education, social

services, and criminal justice. Increasingly, cost-effectiveness in delivering demonstrated social impact is the touchstone for public policy. Austerity policies in many European countries have led to sharp reductions in government funding for heritage agencies and museums, reductions in staff and hours, and on occasion outright closure of cultural institutions. The creation of the Heritage Lottery Fund (HLF) in the United Kingdom in 1994 was a direct response to politicians' belief that funding for heritage would inevitably decline in the face of more urgent demands from other public sectors. That problem has only become more acute in the wake of the Great Recession.

Each of the techniques developed by economists to place absolute or relative values on non-market goods, such as heritage resources, is designed largely to meet the needs of policy makers who seek to justify devoting public resources – both personnel and funding – to matters that politicians and their constituents may find of marginal importance in comparison to funding national defense, education, health care, and social services. The fact that the HLF (Oxford Economics 2016) and European Union agencies (CHCfE 2015) are conducting impact studies of heritage programs is evidence that government funding for heritage is persistently imperiled. Even in countries where spending on culture has been increased, as in Canada in recent years, government agencies are investing after the fact to present solid social impact justification for their decisions.

Exacerbating these trends, especially in the United States where private philanthropy is vital to funding US culture and heritage, is the growing demand from donors for evidence of social impact in exchange for funding support. The trend, inspired by evidence-based thinking in other spheres, is particularly propelled by philanthropists made wealthy in financial services and technology industries who favor market-based solutions to problems, suspect government programs of ineffectiveness and inefficiency, and seek to ensure that their philanthropy has broad positive consequences for important social problems. These "impact philanthropists'" attitudes are reinforced by the growing prominence of the philosophical school of "effective altruism," which argues that ethical behavior demands eschewing spending on matters such as culture in favor of solving social problems.

The challenges for the heritage professions are many. Defining the "social impact" of heritage projects, museums, or research in a quantitative fashion – as can be done for health care or educational outcomes – requires new perspectives on the purposes of heritage-based organizations. Efforts to define the social impacts of heritage – a museum's contributions to educational outcomes or the emotional well-being of visitors, for example – founder on definitions, methods, and data availability. Furthermore, cultural institutions may have only limited direct impact on any particular social metric, even though institutions may contribute in small but cumulatively important ways to many different social goals. For example, an archaeological site may contribute to student educational outcomes, to visitor well-being from being outdoors, and to social cohesion by sharing history and values, and make a modest economic contribution to the community. Yet investing in that site may not be the most cost-effective policy to deliver any one of those benefits. Hence, the search to justify public or private spending based on a "portfolio" of partial but important social impacts may be the next frontier in the debate over the value of heritage.

Cross-References

- ▶ Community Economic Development and Archaeology
- ▶ Council of Europe Framework Convention on the Value of Cultural Heritage for Society (2005)
- ▶ Cultural Heritage Management: Business Aspects
- ▶ Cultural Heritage Management: Cost and Benefit of Change
- ▶ Heritage and Public Policy
- ▶ Heritage Sites: Economic Incentives, Impacts, and Commercialization
- ▶ Heritage Values and Education
- ▶ Heritage Values, Communication of
- ▶ Modern Ruins: Remembrance, Resistance, and Ruin Value

- ▶ Privatization, Public-Private Partnerships, and Innovative Financing for Archaeology and Heritage
- ▶ Sustainable Cultural Tourism Policies: Overview

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Economy, Roman

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Introduction and Definition

The Roman economy was the economic system created by the geographical expansion of the political power of Rome over the Mediterranean and Europe between the third-century BCE and the first-century CE and maintained during the first centuries of our era until its gradual decline in late antiquity. The Roman economy can be seen as the acme of a long period of technological development and economic growth in the Mediterranean, which began in the early first millennium BCE and led to population increase, intensification of land use, economic and political integration, and urbanization. Its decline in late antiquity marks the beginning of a long period of transformation and urban regression in Europe as well as in large parts of the Mediterranean.

Historical Background

Academic History

The history, structure, and performance of the Roman economy have been hotly debated issues since the late nineteenth century. Debate about the Roman economy has long been characterized by a strong emphasis on the differences or similarities between the Roman economy and the economy of

the industrializing world and by an opposition between optimists, who are inclined to emphasize Roman achievement, and pessimists, who are inclined to emphasize Roman shortcomings.

The debate originated in late nineteenth-century Europe, with a big controversy between Karl Bücher and Eduard Meyer being a first major milestone. Bücher argued that the ancient economy was a household economy characterized by self-sufficiency. Meyer attacked this view and maintained that the Roman Empire saw the growth of "big business" and a full development of capitalism.

In the core decades of the twentieth century, a "modernist" paradigm dominated the field. It was most forcefully articulated by Mikhael Rostovtzeff, who argued that the Roman economy was structurally similar to the modern economy but only differed in that it operated on a much smaller scale. Romans had well-developed entrepreneurial mentalities, there was considerable long-distance trade, and the economic fate of cities depended on the degree to which they were able to develop large-scale, export-oriented production.

The 1970s saw a true paradigm shift, basically caused by the work of Moses Finley, who was strongly influenced by both the work of Max Weber and Karl Polanyi and who argued that the ancient economy was, in general, a primitive affair. Long-distance trade was restricted to luxury goods, while bulk demand was satisfied through locally produced wares. Moreover, cultural and societal structures impeded large-scale elite investment in manufacturing and held back economic growth. Cities were centers of consumption (Weberian "consumer cities") and display whose economic fate depended on the presence of a landowning elite, and not on market-oriented export production.

Finley's work proved highly provocative and was subsequently refined, adapted, and contested. Especially in the 1980s and 1990s, Finley's ideas were at the center of a fierce academic debate between "modernists" and "primitivists" – with archaeologists generally opting for the modernist side of the debate. Key issues in the debate were the economic role of cities, the existence of long-distance trade, and the presence or absence of technological development.

After the turn of the millennium, the debate moved beyond the Finleyan paradigm and has begun to explore the relative position of the Roman economy compared to other preindustrial economies, particularly Medieval and Early Modern Europe. In the debate, there is an increasing emphasis on historical change and, particularly, economic growth, issues that had traditionally been absent from both primitivist and modernist accounts of the Roman economy.

Evidence

Debates about the Roman economy are based on a variety of datasets that can be divided into two groups: texts and material remains. There are three groups of textual sources: literary texts, inscriptions, and documentary texts. Roman literary texts (including the law codes) provide snippets of information about economic practice, though they are strongly biased towards the elite point of view and are not necessarily reliable when it comes to understanding the details of everyday economic processes – particularly if these took place beyond the world of the literary and political elites. Secondly, inscriptions incidentally reveal information about urban economic life, particularly in Italy and Asia Minor, and particularly about the social dynamics that surrounded urban manufacturing and commerce. Epigraphically preserved government decrees incidentally shed light on the impact of local and supra-local governments on economic life. Thirdly, documentary texts, including papyri and writing tablets, provide detailed information about all kinds of transactions, including loans, tax payments, sales, and orders, though they are only available for a limited number of areas and sites (e.g., Egypt, Pompeii, Vindolanda).

Archaeological evidence used in the Roman economy debate includes remains of infrastructure and buildings, transport containers, products, coins, and iconographic representations of economic processes. Remains of port and road infrastructure give clear indications about not only the geography of trade routes but also the investment involved in constructing and maintaining the trade

network. Similar information can be derived from the remains of commercial facilities and manufacturing establishments. Transport containers, particularly amphorae, can generally be provenanced and tend to give an indication of the products they contained. Finished products themselves reveal information about provenance and production technology, and through the emerging practice of "stamping," they inform scholars about their makers as well. Coins and coin hoards allow scholars to discuss monetization and coin circulation, which is fundamental to understanding the dynamics of trade and transactions. Iconography plays key roles in debates about the technology of production processes, showing depictions of work equipment that has not been preserved archaeologically. However, archaeological data are biased and unequally divided over the Roman world, both in time and space, and their interpretation is often complicated by their inaccessibility and by varying standards of publication.

While the Roman economy debate until the late 1970s was characterized by an overwhelming emphasis on textual evidence, and particularly on literature, the 1980s and 1990s saw a clear increase in the use of material remains in discussing economic issues. Quantitative analyses of dated Mediterranean shipwrecks and of the geographical spread of terra sigillata pottery from the imperial period had a deep impact on the debate, as had the results of field survey projects. An increased focus on urban production facilities in the late 1990s changed the dynamics of the debate about urban economies. After the turn of the millennium, archaeologists increasingly started to explore the possibilities of scientific analysis, including isotopic and DNA analysis on organic remains, which is now enabling to include material categories into the debate that hitherto had little to offer, such as animal bones and human remains.

Historical Context

The emergence of Rome as a local power in the seventh and sixth centuries BCE was related to its proximity to the major crossing of the Tiber and, thus, to the flow of people and goods between Etruria and southern Latium and Campania. As a consequence, trade and transport were at the heart of the Roman economy right from the start, and the subsequent expansion of Rome, from early on, was characterized not only by the spread of political power but also by the emergence of a tightly knit network of economic connections – partially created by government policy and partially emerging through market interaction. Politics and the economy were closely related: economic integration in many cases preceded and/or fostered political integration, which would then further enhance economic integration. Where this was not the case, Romans sometimes appear to have had clear economic motives for expansion, such as the presence of metal ores that could be mined (e.g., Spain, Dacia).

The city of Rome emerged as the center of gravity of this economic network early on, and the volume of demand generated by the city would become a defining feature of the Roman economy as it developed from a regional center into a metropolis of hitherto unknown proportions. From the middle republic to late antiquity, metropolitan demand was a key driving force behind the Roman economy and, to a certain extent, behind the Roman political system. The Roman metropolis is a feature that sets the Roman economy clearly apart from all its Mediterranean predecessors and separates it from most of the preindustrial economies of Medieval and Early Modern Europe.

The historical development of the Roman economy was closely related to and to a considerable extent conditioned by developments in the Mediterranean of the first millennium BCE. These include, firstly, the colonization of the western Mediterranean by the Greeks and the Phoenicians from the early eighth-century BCE onwards and the subsequent increase in contacts between Etruscans, Italians, and Greeks, which transformed the economic landscape of central Italy and the Tyrrhenian Sea and created long-distance trade routes between Latium and the Eastern Mediterranean. Secondly, an intensification of Aegean and Eastern Mediterranean trade in the second half of the first millennium BCE, and the Hellenization of the East and Egypt after Alexander,

created an intensive trade network that the Romans could easily tap into. A similar network was created by Carthaginian expansion in North Africa and Spain, though this was initially less readily accessible to the Romans. These developments were basic requirements for the much more far-reaching economic integration of the Mediterranean which took place under Roman leadership from the last centuries BCE onwards.

Yet besides economically integrating the Mediterranean to an extent hitherto unseen, the Roman economy also integrated, unlike Greek and Hellenistic economies had done, the European continent into Mediterranean networks of trade and exchange and saw the development of intensive trade and exchange with regions beyond the political boundaries of the Roman world, including Europe and Scandinavia, the Near East, and, particularly, India, which developed a trade connection with Roman Egypt through the desert, the Red Sea, and the Indian Ocean. Further, there were indirect trading connections with China, probably both over land, via the Silk Route, and by sea, via India.

Key Issues/Current Debates

Integration

A key aspect of the Roman economy was the integration of an enormous area into what was, essentially, one economic system – even though the extent of regional fragmentation is not to be underestimated. Economic integration was based on the political unity of the Roman world, which brought advanced, often state-sponsored, transport infrastructure; unity in laws and currency; and the spread, throughout the empire, of large groups of people with good long-distance connections and of two languages that together sufficed to conduct business throughout large parts of the Roman world. All these phenomena were unique, and had not been seen before on this scale and over such a large area. Together, they brought about a dramatic decrease in transaction costs which made long-distance transport and trade more feasible than ever before.

Fundamental to the integration of the Roman economy was the large network of roads, which was created and maintained by the state and which connected inland regions with each other and with the sea. There is debate as to whether these roads were specifically created to foster land transport, but there is no debate about the fact that they dramatically lowered its costs. Though land transport still was much more expensive than river or sea transport, the vast road network allowed traders to penetrate areas that hitherto had been inaccessible at a relatively low cost. Comparable investment is visible in port facilities in the Mediterranean, which became more numerous and also larger.

The establishment of colonies and the settlement of Romans throughout the Roman world, but particularly in Roman Europe, also contributed to the integration of the Roman economy, as Roman communities retained close contact with Italy and the Mediterranean. As a result, much more accurate information about faraway markets would have been available throughout the empire. The spread of Mediterranean culture and consumptive patterns over Roman Europe created considerable markets for Mediterranean products, including wine, olive oil, and fish sauce, that were not available locally. Integration of taste also fostered standardization. Especially in the imperial period, certain products (e.g., shoes) were standardized to an extent that empire-wide trends in design can be perceived.

Agriculture

Agriculture was the basis of the Roman economy and occupied, probably, over 80% of the population. Key crops included the traditional Mediterranean triad of olives, grapes, and cereals. While evidence for agricultural practice is extremely scarce, it is usually assumed that there was relative technological stability in farming methods. Yet Mediterranean farming methods and plant species did disseminate over a large area, including Europe, and there were major developments in the organization of rural space, particularly around colonies. The rationalized organization of the countryside resulting from centuriation lowered overhead costs by improving the accessibility of land and making the organization and planning of agriculture easier. In general, there is a clear increase in the total area used for intensive

agriculture, with intensification being particularly remarkable in the Latin-speaking west. In Roman Africa, field survey has shown an increased use of even rather marginal lands for oleiculture.

While in many parts of the Roman world the small- to medium-sized farmstead was the standard unit in agriculture, there is a clear emergence of farms operating on a much larger scale, including large *villae rusticae* owned by the elite, which came to control significant parts of the countryside (e.g., Settefinestre). There also appears to be an accumulation of estates (*latifundia*) in the hand of increasingly wealthy landowners, some of whom would own a rich portfolio of estates in various parts of the Roman world. It is assumed that this large-scale landowning also fostered new agricultural strategies, including monoculture, and large-scale clusters for processing. Nevertheless, mixed agriculture remained the norm on most farmsteads and *villae*.

The Roman world also saw a clear increase in the amounts of agricultural yields that were consumed at long distances from the place of production. Metropolitan and army demand fostered agriculture throughout the empire, as is attested by literary sources and by the amphora remains from the Monte Testaccio, which show that, especially in the Imperial period, an overwhelming amount of the olive oil consumed in Rome came from Southern Spain. A defining element of the Roman cereal economy was the *annona*, through which the emperor divided grain among the population of the Roman metropolis. Most of this grain came from Egypt and Africa. Other large cities in the empire seem to have had similar vast areas from which they drew their basic foodstuffs, though their economic hinterland is less well studied. Large-scale fish processing and garum production on the coast of Roman Africa and Spain, particularly around the Straits of Gibraltar, was similarly aimed at a vast imperial market.

Raw Materials

As far as the non-food economy is concerned, it is important to distinguish extraction from manufacturing. Raw materials for which there was large-scale and empire-wide demand include a wide range of metals (gold, silver, tin, lead, copper, iron, zinc), stone and marbles, wood, clay, wool, and flax. The availability of these materials differed – some, such as wool, iron, clay, and wood, were widely available, but others, particularly coin metals and marbles, were only found in specific regions or places.

In the case of coin metals, high-quality marbles, and colored stone, there seems to be a direct involvement of the government in extraction: large mines and quarries were generally owned and run by the state, and especially in the case of the important mining regions of Dacia and Spain, the presence of mineable gold and silver seems to have played an important role in conquest. In mining, Romans used advanced hydraulic technologies to get out the metal ores in large quantities, which also involved large-scale investment in aqueducts. They also used Archimedes' screws and water wheels to drain underground mines, so that they were able reach a much greater depth than in earlier periods. Ores were smelted on or near the mining site and then turned into bars or ingots, which were stamped and transported throughout the Roman world. When the imperial government was not directly involved, the evidence suggests more locally oriented extraction through traditional methods and on a much smaller scale. This goes for mining as well as quarrying.

There is clear evidence that materials were transported and traded in more or less raw form over long distances. This included wood, raw wool, flax fibers, stone, and all metals, though trade was much less intensive when materials were widely available. The only real exception is clay, which was generally turned into its final product in a location close to the pit. Glass, dependent on the availability of *natron*, was produced in a limited number of locations – particularly in the Near East – and then transported in raw form to the place where it was turned into a final product, as is indicated by the discovery of raw glass in several shipwrecks. Trade in raw wool and linen was probably limited to the finer qualities from certain regions and to some bulk trade for the metropolitan market of large cities, including Rome itself. Nevertheless, the general picture suggests intensification and integration compared to earlier periods.

Processing and Manufacturing

In processing materials and foodstuffs, and in manufacturing consumer goods, small-scale establishments remained the norm. The typical workshop was situated in one or two small rooms and operated by a small work group organized around a (male) skilled artisan. Investment in production facilities in such workshops was low, and while the workspace was well-organized, the success of the workshop mainly depended on the artisanal and organizational skills of the work group and, particularly, its leader. In an urban context, workshops would be situated in or attached to a house, and members of the (family) household would form the core of the work group. Most of this production also seems to have been directly oriented towards private customers rather than traders and thus towards local consumption: many workshops had a shop or were situated in one, and iconographic representations of craftsmen show their interaction with customers as well as their work on the products.

Yet alongside this traditional, small-scale manufacturing world, there also is an emergence of manufacturing or processing establishments operating on a much larger scale. More often than not, these also were related to long-distance trade. Imperial period fish-salting establishments in North Africa and Southern Spain could reach vast dimensions, and their products were consumed throughout the empire. High-quality tableware pottery (terra sigillata) was produced in a limited number of production sites where kilns and workshops would operate on a large scale, such as at La Graufesenque or Scoppietto. Fulling factories at Ostia and Rome employed up to 100 people and stood at the end of long-distance clothing trade catering for the metropolitan market. Large-scale workshops could be highly rationalized and use a strict division of labor and rudimentary materials handling. Literary texts further suggest the existence of cities producing large amounts of textiles, though here, individual production units may have remained small.

Commerce

Roman cities were centers of consumption-oriented commerce, and commercial facilities played a highly visible role in the urban landscape. Streets, especially in and around city centers, tended to be lined with shops. These had wide openings on the street that fostered interaction between retailers and passersby. This is a big development from the Greek and Hellenistic world, in which shops were much less common and had less wide openings. Here, commerce was more focused on the agora and private houses. There is a clear change in the commercial articulation of cities in the Roman world, particularly, but not exclusively, in Roman Italy.

Most shops were related to houses. Medium-sized atrium houses in Italy would have one or two shops next to their main entrance; larger houses could have up to ten. The strip buildings dominating the cities of Roman Europe also often would have a shop in front. Besides these privately managed commercial facilities, there also is a spectacular proliferation of market facilities, such as *macella* and *fora*, and other buildings with a (partially) commercial function, such as *basilicae*. Most of this was the result of either state-sponsored initiatives or, more frequently, euergetism or investment by members of local elites. In cities with larger consumer markets, purpose-built shop complexes emerge, as happened in Pompeii from the second c. BCE onwards; the exceptional consumer market of Rome saw the construction of true shopping malls, such as, most dramatically, Trajan's Markets.

This formalization of commercial space occurred, however, against a background in which informal commerce also played a key role. There is considerable evidence for street sellers and itinerant merchants, who operated on the street rather than in shops or visited their customers in their homes. Epigraphic evidence points to the existence, in many cities, of periodic markets taking place on fixed days and following a fixed schedule within a certain region. This also emphasizes the economic role of cities as central places where people from the surrounding countryside could go to get goods and products that were not available in or around their villa or village.

Technology

Technological innovation is a hotly debated issue among scholars. It is uncontroversial that the spread of the Roman economic network over Europe brought a spread of established, more advanced Mediterranean technology over a large

area that technologically had been less well developed and that this had some economic effect. Yet, beyond that basic tenet, opinions diverge sharply: some argue in favor of significant technological advance, while others argue in favor of technological stagnation. There is, in fact, something to say for both sides.

In general, stability was the norm, and production processes technologically tend not to differ radically from earlier periods. A key example is textile production: spinning and weaving were done with traditional instruments like the spindle and the warp-weighted loom. While there is evidence for the emergence of the more advanced horizontal loom in late antiquity, it does not seem to have become widespread very quickly. A similar picture emerges from blacksmithing and bronze working. While pottery production saw a clear increase in the use of molds for high-quality tableware, this must be seen as a change of strategy rather than as technological innovation: the technology had been around as early as the Bronze Age and was widely used already before the Roman period.

This is not however the whole story of Roman technological progress: there are several key technologies that found their first widespread application in the Roman world. Important is the material revolution caused by the spread of glassblowing in the first-century AD: glass vessels quickly began to compete with their terracotta and metal equivalents, transforming the dynamics of the tableware and storage ware economies. The invention of the screw press, presumably in the late first-century BCE, had an impact on olive and wine production as well as on the textile economy.

Yet the technological development that is most radical and most hotly debated is the application of water power in several manufacturing processes in the imperial period. While few scholars doubt that the principles of mechanical water power were understood in elite circles, it was long disputed to which extent these principles actually were applied in everyday economic life; however, archaeological work has now confirmed that water power was not only much more common than was assumed in the past but also was a clear development of the Roman imperial period. Attested are water-powered installations for milling flour (e.g., at Barbegal and in Rome) but also to saw stone (e.g., at Ephesos).

Growth

Since the turn of the millennium, the Roman economy debate has developed a strong focus on understanding the scale and nature of economic growth. Most scholars now believe that there was at least some form of aggregate growth in the Roman economy in the late republic and the early empire. It is believed that maritime transport reached a high peak in this period and that this is somehow reflected in the chronological spread of Mediterranean shipwrecks, which shows a clear peak between 100 BCE and 100 CE. Several other datasets have been thought to show similar peaks, including air pollution levels as recorded in the Greenland ice cap. All these data are, however, controversial, so while the general picture of growth is not in doubt, it has not yet been possible to map its precise chronological development or its geographical dimensions.

However, the issue at stake is not so much the occurrence of economic growth in itself but rather the relation between growth and demographic expansion: if the economy grew faster than the population, GDP per capita would rise, and living standards would increase. If this was not the case, GDP per capita would be stable or decline and so would living standards. The question thus is to what degree the Roman economy was able to improve average living standards. The way to do this would be through technological innovation and lower transaction costs, which would enhance productivity. While it is acknowledged that Roman economic integration lowered transaction costs and that there was innovation in some sectors of the economy, it is controversial as to whether these developments really led to sustained per capita growth. Some scholars have embraced the Malthusian model of economic growth, which predicts that, in pre-industrial economies, the improved living standards generated by per capita growth directly lead to population increase, which eats away the positive effect, so that living standards will have remained approximately at the same low level. Other scholars point to the boom in investment in public monuments and urban leisure facilities such as baths, theaters, and amphitheaters and to the increasingly wide diffusion

of luxury goods and domestic decoration throughout the Roman world, both of which suggest that average living standards were raised to considerably above subsistence level in the early empire. However, this was not necessarily reflected in health and life expectancy, both of which, as analyses of skeletal remains and epigraphy suggest, seem to have remained at levels that are roughly typical for the preindustrial world.

Decline

The strong focus on late republican and early imperial growth in the scholarly debate has not yet been matched by an equally strong focus on the economic history of the Roman world after the second century, when growth evidently came to a halt, and the empire and its economy ran into trouble. Traditional accounts saw the late second century as the beginning of a sharp decline that in the end inevitably led to the collapse of the Roman economic system. Current views are more nuanced and emphasize the dynamic and unpredictable nature of developments and the different fates of different regions, with the Eastern Mediterranean enjoying sustained stability for much longer than the rest of the Empire and economic changes in the Latin-speaking part of the Roman world not only starting earlier but also being more drastic. While for the Eastern Mediterranean it is, in certain ways, possible to speak of a "transition," for the western half of the empire and specifically Europe, "decline" seems a more appropriate term.

The symptoms of decline become first visible towards the end of the second century. The large-scale imperial mines and quarries are deserted in the last quarter of the second century, which is followed by a strong debasement of fine metal in coinage. Investment in large-scale processing and manufacturing plants is severely reduced, with few new constructions, and some going out of use or continuing on a smaller scale. There also seem to be maintenance difficulties in the road network; silting problems in harbors are less rigorously tackled than had been done before, with some notable exceptions. This points to a decline in long-distance trade, which also may be reflected in the decrease in shipwrecks from this period (though this also may be related to a partial replacement of amphorae by barrels). Monumental construction – both imperial and euergetic – declines strongly, especially after the Severan period, taking away one of the motors of early imperial Roman urban economies. Price inflation and state attempts to control the market under Diocletian point to a perception of serious economic turmoil by the imperial elite.

As to what caused the changes after the second century, there is a range of possible causes. They can, roughly, be divided into external causes and internal ones. External causes contributing to economic turmoil include several epidemics that hit the empire in the late second and third centuries, including the devastating Antonine Plague, which raged for 20 years and caused a significant decrease in population. Moreover, the third century brought intensive warfare at the frontier and several massive invasions from non-Roman Europe. Some scholars have also suggested that the early imperial economy was brought into trouble by climate change. Internal factors contributing to decline may include political unrest and the long political crisis of the mid-third century. Further, a fallout in investment may have led to consumer economies coming to a standstill, while increasing economic inequality caused more and more wealth to be concentrated in the hands of the elite, which has been thought to affect the buying power of the rest of the population. Some have argued that early imperial economic prosperity simply was not sustainable, so that part of the process taking place in the third century would be a natural correction. Yet, it is sometimes hard to distinguish causes from effects, and in reality, many of the abovementioned factors may have contributed to decline and transformation; the debate on this issue has not yet produced a dominant theory.

Cross-References

- ▶ Infrastructure in the Roman World: Roads and Aqueducts
- ▶ Trade and Transport in the Ancient Mediterranean
- ▶ Villas and Farms in the Mediterranean World

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Educational Tools and Techniques in Archaeology: Overview

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Introduction

The teaching of and about archaeology is a subject of global interest. As a subject, archaeology has the potential to both engage the public in the study of the past and to also increase awareness of environmental and cultural heritage preservation. As a mode of teaching, archaeological thinking is an educational tool in itself, creating a learning environment which is instantly engaging (Bartoy 2012: 558) and introducing subject matter which is broadly relatable. Several educational tools and techniques are used in archaeology to enhance its educational role (Ducady et al. 2016), including teaching reasoning ability in combination with an understanding of, and respect for, cultural diversity and tolerance. Notwithstanding these significant benefits, archaeology remains underutilized within a global context within both secondary and tertiary teaching, with many archaeologists underestimating its educational role (Henson 2004).

Definition

According to SALTO (Support, Advanced Learning and Training Opportunities) for Youth – the European Union program for education, training, youth, and sport – an educational tool could be defined as "an instrument to transfer and implement educational objectives into a practice which engages participants in the complete learning process" (SALTO Newsletter n.d.). In this regard an educational tool should be self-sustaining and may be of a range of lengths. An educational technique is defined as "the method of doing

something using a special skill that you have developed" (Macmillan Dictionary), further described by the Council of Europe as being closely related to experiential learning. Educational programs and techniques ensure equal opportunities for all, and they must be designed in order not only to transfer knowledge but also to support training and raise public awareness (Mackay and Bilton 2003: 48–49).

When educational objectives specifically relate to the teaching of archaeology, appropriate tools and techniques must be developed to complement the wide range of skills and subdisciplines within the field. The teaching of archaeology may occur in a range of formal and informal settings, including universities, schools, and community groups. Further, location-based training is a critical component in archaeological education, which can occur in a range of settings from classroom or museum venues to programs focused on site- and landscape-based learning.

Key Issues/Current Debates/Future Directions/Examples

The educational tools and techniques used in archaeology derive from the field of pedagogy and didactics. Vygotsky's social constructivism is the main learning theory followed by the current museum or archaeological educational programs. As a result, it determines their design, objectives, and application. Via educational tools and techniques, archaeology is "recontextualized" (Bernstein 1996) into learning material for all students regardless of gender, nationality, and religion (Croucher and Romer 2015), either in schools (Smardz and Smith 2000) or colleges and universities (Burke and Smith 2007).

The purpose of educational tools and techniques is also to teach archaeology to the wider public (AAP 2016). A critical issue in the context of public archaeology is whether the aim is not only to teach the theoretical and practical sides of archaeology but whether to teach through archaeology (Bartoy 2012). Therefore, the use of educational tools and techniques in archaeology could be classified into three categories: those that treat archaeology as the ***object*** of learning about the practice of archaeology, those which use it as a ***source*** for enhancing knowledge about the past and finally, and those that use archaeology as a mode of learning. All of these categories can utilize lectures, practical demonstrations, the construction of narratives, and printed material including lesson plans, pictures, illustrations, slides, posters, brochures, and handouts. These forms of learning can take place both within the classroom and during outdoor activities including fieldwork training, hands-on activities using objects and artifacts, place-based activities, and problem-solving or simulation exercises and through gaming.

Archaeology has, and continues to be, taught using a combination of tools and educational techniques. Theoretical content has traditionally been taught through the use of lectures and narratives. Additionally, since archaeology also has a material dimension, hands-on teaching is widely used, implemented as early as the time of the well-known educator John Dewey and his Laboratory School. This approach –learning by doing – is fundamental within the teaching of archaeology. Thus, lectures describe the subject of archaeology, while narratives create representations and constructions of the past based on archaeological finds without the participation of the learner. On the other hand, the direct contact of students with the findings and techniques of archaeology ensures the success of learning in an experiential setting. In this context, simulations of archaeological excavations, role plays, or storytelling by the students themselves offer credible and constructive contacts with the world and thinking of archaeology.

The participation of a broad demographic through excavation simulations is a popular and effective mode of teaching archaeology. A usual simulation dig process is as follows. Participants "excavate" and discover buried copies of artifacts. These finds are then processed as they normally would on a professional excavation – they are cleaned, measured, sketched, and described. Field workers also keep a trench diary and undertake artefact analysis, simulating the role of the professional archaeologist. Finally, especially in museum educational programs, they connect their

finds with exhibits in real museum exhibitions. Hands-on activities or exploratory games, often in the form of a detective story or a treasure hunt, are very common in schools and museum settings.

Another mode of archaeology engagement in teaching is "museum kits," primarily designed for use within the classroom. Each of these kits contains copies of artifacts, replicas, photographs, booklets, and other teaching materials on a particular archaeological subject. In Greece, for example, there are museum kits designed by the Acropolis Museum, the Cycladic Museum, and other cultural organizations on themes including the Parthenon frieze and aspects of ancient life, like clothing, nutrition, or games. These kits are also targeted at a broad range of users within the community, including multisensory kits for the disabled.

In choosing existing tools and in developing new techniques for the teaching of archaeology, it is critical that we also consider inherent biases. Each has, or will, be based on national and international education policy as well as existing courses and curricula. Further, parameters such as learning theories, educational practices, as well as the actual and sought teacher and student identities are relevant for the realization of the educational objectives. The identification of these biases can serve to highlight the dominant perceptions about the meaning of the past in the present, especially if we accept that "teaching is a field of cultural politics" (Hamilakis 2004: 294). In doing so, we aim to minimize our own biases within our teaching, built on our existing assumptions and beliefs about the past.

Modern pedagogy emphasizes the contribution of three factors which are critical to the success of an educational tool or technique (Lankshear and Knobel 2011). Firstly, there is a direct correlation between student participation and the quality of the learning experience. Secondly working in groups, or collaborative learning, is recognized as a highly successful mechanism for the transfer and creation of knowledge. Finally, the incorporation of information and communication technologies (ICT) into the learning framework, and the new knowledge environment which is created, should be taken seriously in today's digital age. The relationship of archaeology as a discipline with each of these factors is apparent through the focus on student engagement, collaborative learning, and the use of ICT. Subsequently, teaching through archaeology not only enriches educational experiences but also makes them creative and innovative.

The project method seems to be one of the most accurate pedagogical tools to develop creative individuals (Nikonanou et al. 2004) and could be highly effective when applied to the field of archaeology. The major advantages of using this method include experiential and social learning, working in groups, problem-solving, cross-thematic and cross-curricular approaches and, above all, the active participation of the students, in equal collaboration with the teacher, in the selection, organization, and design of learning materials. Another teaching tool with great potential for application within the field of archaeology is the use of teaching scenarios (Allen 2007). In combination with the use of ICT, scenarios can include archaeological inquiry and interpretation, the ethics and politics of archaeology, public perception of the discipline, values about cultural heritage management, and the understanding of cultural diversity.

Undoubtedly, all the above traditional or innovative tools are further enriched today by the use of ICT. Online lectures and narratives, images and videos, 3D representations and virtual reality constructions, educational robotics, digital surrogates of archaeological objects, online knowledge, and investigation games create a new digital experience that transforms traditional activities into visual and digital immersive experiences. This innovation also requires the development of new teaching and learning skills, particularly in the sphere of digital literacy. Educational activities within this area are broad ranging, with user preference identified for six specific activity types – creative plays, guided tours, interactive references, puzzle/interactive mysteries, role-playing stories, and simulations (Schaller et al. 2002). The British Museum's site "Ancient Greece" (http://www.ancientgreece.co.uk/) is a good example of the use of these innovative teaching and learning methods.

It is expected that educational tools and techniques in archaeology will have a significantly higher digital dimension in the future. The increasing spread of the Semantic Web, the availability of open digital content, and the increased development of e-learning will create new learning and learner participation conditions. Moreover, emerging ultramodern digital technologies like wearable computing, mobile and pervasive computing, ubiquitous computing, augmented reality, quick response (QR) codes, and intelligent environments or intelligent intuitive interfaces will alter human experience. In the future human-computer interaction, on brain computer interfaces and vision-based interfaces, will ensure that educational tools and techniques will be different in critical ways. Learning experiences without the need of a traditional computer ("disappearing computer"), the need for contextual information and ambient intelligence, and the mixture of natural interfaces and embodied cognition with evocative/smart objects will transform the whole educational environment.

Subsequently, the educational tools and techniques should seek to embrace these new developments. A simulated dig, for example, enhanced by QR Codes and augmented reality could be a combination of physical and digital interactive experiences. The ability to visit archaeological sites around the world could be similarly experienced as a daily activity within the classroom through the use of augmented reality. The current challenge is, and will remain, how to ensure that the use of appropriate educational tools and techniques empower learners to build their own learning environments, enabling them to investigate the past and the present through the application of archaeology. In this new digital knowledge environment, the intended learning goals are associated with multiliteracies and making meaning in multimodal ways, while students are regarded as active producers and not passive consumers of knowledge. New learning theories, such as *Learning by Design* (Cope and Kalantzis 2000), take into account this new context. The challenge will be, finally, to help learners create critical awareness about the past both within local and global contexts, as modern citizens of the world. The appropriate incorporation of archaeology into teaching scenarios could be a very effective educational tool in this case (Touloumis 2008).

Cross-References

- Adult Education in Archaeology
- Constructivism in Archaeology Education
- Formal Education Up to Age 18, Archaeology in
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- Internet Use for Archaeological Education
- Material Culture and Education in Archaeology
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Egypt: Islamic Archaeology

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Introduction

Egypt holds a key strategic location at the conjunction of several important waterways: the eastern end of the Mediterranean Sea, the River Nile, and the Red Sea. In addition, the rich agricultural resources of the Nile Valley and Delta, sustained until the twentieth century by the annual flood of the Nile, have enabled the country's population to produce agricultural surpluses that were used throughout classical and medieval times to support other areas of the polities of which Egypt formed a part. These factors gave Egypt considerable economic and political importance that is reflected in its position as a key province in the Islamic world. The nature and distribution of (historic and modern) settlement in the country, however, and associated issues regarding the preservation and accessibility of archaeological remains have created considerable challenges for archaeologists. Much less research on medieval heritage has thus taken place here in general than is the case for countries such as Syria and Jordan, where settlement was and is more spread out across the landscape. Nonetheless, the sometimes exceptional nature of archaeological preservation in Egypt's dry environment has yielded results of considerable significance including organic remains such as textiles and documents, and the importance of the country should not be overlooked despite the limits of our current archaeological knowledge.

Definition

Around 95% of the surface of the modern nation-state of Egypt is desert, historically occupied only by sparse nomadic populations, for the exploitation of mineral resources and for the transit of people and trade goods along particular routes. Throughout the country's history, the vast majority of its occupants have clustered together in the Nile Valley and Delta and in the nearby Faiyum Oasis; there are a handful of additional, smaller, oases lying further into the Western Desert (including Siwa, al-Bahariya, al-Farafra, al-Dakhla, and al-Kharga). During the medieval period, there was some penetration from Egypt southward into Nubian territory, and the conversion of Nubian populations to Islam in the later medieval period led to the development of new Muslim-controlled territories in the northern part of the modern state of Sudan that have some cultural and archaeological synergies with southern Egypt. The construction of the High Dam at Aswan in the mid-twentieth century, however, and the associated creation of Lake Nasser submerged almost all archaeological resources in Lower Nubia; medieval remains were not entirely overlooked but were in general poorly served during the campaigns of survey and rescue excavation that accompanied this massive engineering project in comparison with in particular Pharaonic sites.

Medieval Egypt was occupied by a population with diverse identities and in particular religious affiliations. In the early Islamic period, Muslims were a ruling minority, with conversion to Islam gathering pace through the ninth and tenth centuries. Today, Egypt still has a Christian (largely Coptic) minority of perhaps 10%; its modern Jewish population is tiny but was significant in medieval times as evidenced by the Geniza archive from Old Cairo. Conceiving of "Islamic Archaeology" in the broadest terms (as many scholars do) as relating to the study of territories and peoples under Muslim rule, we can see that a diverse range of sites and lifestyles, including those typically investigated by the field of Coptic Archaeology, will be of relevance to our understanding of medieval Egypt.

Historical Background

Significant damage had already been done to many of Egypt's post-Pharaonic archaeological sites prior to the emergence of archaeology as a modern discipline. Many of the country's important Pharaonic temples became the foci of classical and medieval settlements, often remaining occupied until relatively recently. In the nineteenth and early twentieth century, many of these sites, including Luxor Temple and Medinet Habu in Luxor and Philae Temple in Aswan, were cleared of these later mud-brick phases, usually with little recording (Hölscher 1954 provides the most detailed record of one such clearance). An additional cause of damage to medieval sites during this period was the practice of *sibakh* digging: the extraction of archaeological deposits rich in organic material and silt from mud-bricks for use as fertilizer, which was conducted at an industrial scale. Artifacts of value that were uncovered during *sibakh* digging (e.g., sites in the Faiyum Oasis yielded a wealth of papyri) were usually sold on the open market.

One such commercial *sibakh* extraction took place among the mounds of al-Fustat, now in the south of modern Cairo. Al-Fustat was Egypt's early Islamic capital city, founded in 641-2 following the conquest of Egypt. It rapidly became a large and important center, remaining so until the eleventh century. In the late nineteenth and early twentieth century, the expansion of Cairo's population brought settlement into the area of the archaeological mounds, giving rise to intensive digging for construction purposes, for *sibakh* mining, and to retrieve saleable artifacts. Decontextualized objects from the mounds of al-Fustat appearing on the antiquities market attracted the attention of Ali Bahgat Bey and Albert Gabriel, who worked in conjunction with commercial diggers as a form of salvage excavation for more than a decade, ending in 1924 (Fig. 1). An extensive area of early Islamic housing and streets was uncovered and recorded to the standards of the time (Bahgat and Gabriel 1921–1928; Bahgat 1923). Archaeological work continued sporadically through the 1930s–1960s under the auspices of Cairo's Museum of Islamic

Art, and the finds recovered by all these scholars formed the basis of that institution's collections.

The Bahgat and Gabriel excavations of al-Fustat triggered or reflected a growing interest in Egypt's medieval material culture, long overshadowed by the country's Pharaonic past. Scholarly interest in historic Christian architecture in the region had begun toward the end of the nineteenth century (see, e.g., Butler 1884), but structures other than churches and monastic buildings were slower to attract the attention they undoubtedly deserved. Starting in the 1920s, wider studies of extant medieval architecture appeared, including Islamic monuments, with the publication of multiple works by scholars such as Ugo Monneret de Villard (1930, 1935–1957, inter alia) and K.A.C. Creswell (1932–1940, 1952–1959). The development of Islamic archaeology in Egypt can thus be seen to parallel the wider emergence of the discipline, under the early influence of art and architectural history and the antiquities market, and in the shadow of the study of the ancient Near East.

It was again at al-Fustat that more modern archaeological work on Islamic Egypt was undertaken. As had been the case at the time of Bahgat and Gabriel's excavations, a construction boom and the ongoing expansion of housing into the area of the site created a need for urgent salvage archaeology. A project was thus initiated by George Scanlon and Władysław Kubiak in 1964 and continued until 1980, excavating in diverse parts of the site and uncovering significant areas of the city's residential quarters. Regular preliminary reports were published throughout this period, primarily in the *Journal of the American Research Center in Egypt*. However few syntheses have appeared (an exception is Kubiak and Scanlon 1989; see also Kubiak 1987), and thus, although the preliminary reports include a wealth of detail, the earlier ones in particular have to be read in light of the inevitable subsequent development of the excavators' interpretations, especially as regards chronology.

Scanlon and Kubiak's work at al-Fustat substantially moved forward scholarly understanding not just of medieval urbanism and material culture in Egypt but within the wider region. As an early Islamic urban foundation, the site had (and still has) much to contribute to debates on the development of inherited urban forms in comparison to newly created foundations. Some slight traces of

Egypt: Islamic Archaeology, Fig. 1 Fertilizer extraction among the mounds of al-Fustat. (Bahgat and Gabriel 1921–1928, vol. 2: Plate 2; image courtesy of the Warburg Institute, accessible at: http://catalogue.ulrls.lon.ac.uk/record=b2458219~S12)

the earliest phases of the town were uncovered, mainly as deposits in refuse pits and the lowest street levels; the relative scarcity of levels from the seventh and eighth centuries was largely due to their destruction during later rebuildings. The majority of the architecture recorded on the site was of ninth- to eleventh-century date, and domestic structures varied considerably in size, quality, and by association also in terms of the wealth of their occupants. Complex systems of waste disposal were commonly cut into the bedrock. Following the end of the heyday of al-Fustat, which burned in 1168, much of the site was used for industrial activity, in particular ceramic manufacture, and Scanlon and Kubiak uncovered kilns and associated infrastructure overlying the domestic levels. The diversity of the built city that was uncovered and the range and quality of finds (echoes of the art-historical origins of the discipline remained in the treatment of these, with only glazed and decorated wares from the total assemblage of pottery being published) created continuing interest in Egypt's Islamic archaeology.

Al-Fustat was not the only medieval site undergoing excavation at this time. To the south in Lower Nubia, the site of Qasr Ibrim – the only site to survive the rising waters of Lake Nasser due to its location high on a cliff – underwent excavation by the Egypt Excavation Society from 1963, continuing intermittently until 1998 (Adams 1996, 2010; Aldsworth 2010). Despite the rising water table, conditions at Qasr Ibrim allowed astonishing organic preservation, including textiles, papyrus, parchment and paper documents, leather, wood, and plant and animal remains (Fig. 2). All these artifacts shed much light on conditions of occupation at the site, from an eighth-century letter to the Nubian king regarding the *baqt* treaty with Egypt, via the burial of a fourteenth-century bishop through to evidence for the domestic conditions of the nineteenth-century Ottoman garrison. The location of the site beyond medieval Egypt's southern border provides opportunities to investigate political, economic, and cultural interactions between Egypt and Nubia at both the formal and informal level. Again, although some preliminary publications appeared through the course of the excavations, broader syntheses have appeared only recently; perhaps the impact of both the al-Fustat and the Qasr Ibrim excavations outside Egypt has been somewhat reduced by these delays in the dissemination of the results from their early seasons.

Egypt: Islamic Archaeology, Fig. 2 Late medieval Old Nubian manuscript fragment found on the floor of the cathedral at Qasr Ibrim during the 1963–1964 season of excavations, depicting an archbishop, now held in the British Museum (accession number EA82963). (Image courtesy of Pamela Rose and the Egypt Exploration Society)

In 1959 excavations had commenced at the site of Kom al-Dikka in Alexandria, better known for its extensive Roman archaeology than for its medieval strata. Classical levels, in particular the theatre, were, however, overlain with a Muslim cemetery, in use intermittently from the seventh to the early twelfth century, which was excavated during the late 1960s and early 1970s by a Franco-Polish team, the human remains being analyzed by Elżbieta Promińska (1972). This is still the only significant body of osteoarchaeological data from medieval Egypt. A decade

later, on the Red Sea coast, excavations were conducted by Donald Whitcomb and Janet Johnson of Chicago's Oriental Institute at the late Ayyubid to Mamluk port of Qusayr al-Qadim between 1978 and 1982 (Whitcomb and Johnson 1982), a project that again saw the retrieval of important organic artifacts including paper documents and that arguably provided the springboard for a series of more recent Red Sea excavations focusing on Egypt as one end of an extended network of maritime Indian Ocean trade (see below).

The projects outlined above created the foundations for more recent work, which has built on them in various ways. The focus on Cairo, and on sites located toward the maritime and riverine frontiers of Egypt, can certainly be traced into the present. Some new strands of research have developed, while some older ones have fallen by the wayside.

Key Issues/Current Debates

Islamic archaeology as a discipline has historically focused on urban centers, and this largely remains the case for Egypt. Archaeological work has been and is still dominated by results from Cairo, initiated by the large-scale excavations of al-Fustat by Bahgat and Gabriel and Scanlon and Kubiak discussed above. More recent and current work at al-Fustat includes the French excavations at Istabl Antar, directed by Roland-Pierre Gayraud between 1985 and 2005; Japanese excavations of the central quarter of al-Fustat, directed by Kiyohiko Sakurai and Mutsuo Kawatoko between 1978 and 1985, more recently revisited in 1998; unpublished Egyptian excavations in the area of the Sabaʿa Banaat mausolea, directed by Ibrahim ʿAbd al-Rahman and Mamdouh al-Said in the late 1990s/early 2000s; and American/British excavations of Islamic-era and earlier occupation within and around the Roman fort of Babylon, Old Cairo, directed by Peter Sheehan (Gayraud 1998; Kawatoko 2005: 846–8; Sheehan 2010) (Fig. 3). Further north, French excavations directed by Stéphane Pradines have investigated the northeast corner of the city walls of the Fatimid suburb of al-Qahira since 2000 (Pradines et al. 2009). The numerous architectural studies and heritage management projects in historic Cairo, the most notable additions to which in the last few years have been by Nicholas Warner (2005) and the Aga Khan Development Network, will not be discussed here. Due to twentieth-century population expansion and the built-up nature of the

Egypt: Islamic Archaeology, Fig. 3 Brick and stone structures of Fatimid and Ayyubid date, respectively, forming part of the complex archaeological sequence at Dayr al-Banaat, Old Cairo, excavated during archaeological monitoring by the American Research Center in Egypt of the USAID-sponsored Contract 102 Old Cairo Groundwater Lowering Project. (Image courtesy of Peter Sheehan)

modern city, however, our knowledge remains greater for the southern and eastern fringes of the historic settlement, rather than uncovering the wider urban landscape. A city-wide program of archaeological monitoring, similar to that directed by Sheehan in Old Cairo or Wolfgang Müller in Aswan (see below), seems unlikely to take place in the near future; but this is what would be needed to improve the state of our knowledge in this respect.

It is not only in Cairo that accessibility of urban archaeological resources is a problem, and only in a handful of places have excavation strategies been implemented to address this. A program of archaeological monitoring of urban development has been ongoing in Aswan since 2000, undertaken by the Swiss Institute for Architectural and Archaeological Research on Ancient Egypt in Cairo in collaboration with the Egyptian Supreme Council for Antiquities and directed by Wolfgang Müller, Cornelius von Pilgrim, and Muhammad al-Bialy (Schweizerisches Institut n.d.). To date, more than 90 separate areas in the central part of the city have been investigated, shedding light on features including the riverfront, civic structures, and settlement extent (Fig. 4). The extramural cemetery, to the east of the medieval center, was the subject of a further project, directed by Philipp Speiser, which recorded architecture and burial practices with a view to understanding changing activity through time. Alexandria has also received similar attention from archaeologists at the Centre d'Études Alexandrines. However there remain many significant urban centers of medieval importance – for example, Minya in Middle Egypt – that are almost entirely overbuilt and where no archaeological research has yet taken place. Even those urban sites that are not altogether overbuilt are problematic. The activities of the *sibakh* diggers badly damaged the uppermost levels of many of the large Roman, late Roman, and early Islamic archaeological sites, to the point where their stratigraphy is seriously compromised. Examples of such sites include Elephantine in Aswan and Antinoopolis and Ashmunein in Middle Egypt.

The accessibility of much of Egypt's medieval archaeology is thus inherently problematic, and the logistical and methodological challenges this poses go much of the way to explaining the reduced levels of archaeological activity in comparison with the more extensive fieldwork that has taken place in, for example, Syria and Jordan. These taphonomic processes have shaped our understanding more than they ought to have done. The existence on the one hand of great

Egypt: Islamic Archaeology, Fig. 4 Aswan's riverfront wall, preserved to some 8 m in height with a possible water-wheel emplacement, in area 52 of the Swiss-Egyptian Joint Mission at Old Aswan; the wall seems to have fallen out of use in the second half of the fourteenth century. (Image by Axel Krause courtesy of the Swiss Institute for Architectural and Archaeological Research on Ancient Egypt in Cairo)

classical sites with damaged early medieval levels, and on the other of medieval centers with their early development obscured by modern settlement, has led to a perception of settlement dislocation at or around the time of the Muslim conquest (Gascoigne 2005). Although discourse has in general moved away from the view that the conquest was destructive and disruptive – assumptions historically rooted in outdated colonialist views of Arab culture as uncivilized – it has been difficult to investigate the development of early medieval urbanism in Egypt in any detail, and interpretative frameworks have been limited, often focusing on influences from outside Egypt (e.g., the Samarra-style houses of al-Fustat, the introduction of the *iwan*, the influence of Chinese porcelain on early glazed wares).

There are exceptions to the accessibility issues outlined above. Sites on some stretches of Egypt's coast have not been completely overbuilt, although many (e.g., Alexandria, Dumyat, Suez) are almost entirely so. The Red Sea coast in particular, in addition to the north-east Delta edge and Sinai, contains several medieval sites of considerable interest, which have seen some investigation in recent years. Of the Red Sea ports, Qusayr al-Qadim is arguably most well known; following the American excavations discussed above, further work was undertaken by David Peacock and Lucy Blue between 1999 and 2003 (Peacock and Blue 2006–2011). The Ottoman-Napoleonic fort in the town of Qusayr has also been the subject of archaeological investigation (Le Quesne 2007). A Japanese team has excavated the medieval settlements at Raya and al-Tur on the Red Sea coast of Sinai (Kawatoko 2005: 851–5). The important southern Egyptian Red Sea port of ʿAydhab, however, is not easily accessible due to its militarily sensitive location on the Egypt-Sudan border and in recent times has been analyzed only through satellite imagery (Peacock and Peacock 2008). On Egypt's Mediterranean coast, the ports/fortified urban centers at al-Farama (Pelusium) and Tinnis have undergone some archaeological investigation. Al-Farama has been the subject of Egyptian, French, and most recently Polish projects, the latter undertaking geophysical survey (Fig. 5). Focus has tended to be on the classical phases of occupation; the medieval settlement is not well investigated, and a misconception concerning the date of the rectangular enclosure (which is early Islamic, as are the walls of Tinnis, and not Roman as often stated) lingers in the literature. At Tinnis, a program of topographical and geophysical survey directed by Alison Gascoigne (since 2011 with John Cooper) has clarified the urban layout, identifying and recording features including the city enclosure wall, canals, the town's citadel, industrial complexes, and a street layout that appears sub-rectilinear in places (Gascoigne et al. 2020) (Fig. 6). A series of sites including forts and water infrastructure associated with

Egypt: Islamic Archaeology, Fig. 5 One of the gateways into the early Islamic-era walled city at Al-Farama, following restoration. (Image courtesy of John Cooper)

Egypt: Islamic Archaeology, Fig. 6 View along the line of the enclosure walls at Tinnis. (Image by the author)

Egypt: Islamic Archaeology, Fig. 7 The early Islamic-era fortress of Hisn al-Bab, overlooking the First Cataract of the Nile. (Image courtesy of Pamela Rose, 2006)

routes across Sinai have also been preliminarily investigated (Mouton et al. 1996). Also on the fringes, if not the coast, of Egypt lies the well-preserved Roman and medieval fortress of Hisn al-Bab on the First Cataract of the Nile, subject of excavations directed by Pamela Rose of the Austrian Archaeological Institute (Fig. 7).

A second group of medieval archaeological sites that has seen considerable attention in recent years is associated with late antique and medieval Coptic monasticism. As with some of the sites discussed previously, this is due to their locations, in these cases often set back from the cultivation on the desert edge. Themes emerging from current projects include lived monastic experience (use of domestic architecture, diet, lifestyle, daily routine, etc.) and its embedding within a wider cultural context; the enmeshing of monastic institutions within the regional economy; and an increasing emphasis on continuity of late Roman to post-conquest monastic prosperity. There is not space here to present an exhaustive list of the numerous

projects behind these developments, which are spread widely across Egypt: only a few are noted here. In the Wadi Natrun, excavations at the Monastery of John the Little have been undertaken since 2006 by the Yale University Monastic Archaeology Project, overseen by Stephen Davis and directed in the field initially by Darlene Brooks Hedstrom (2006–2010) and currently by Gillian Pyke (2011–present) (Brooks Hedstrom et al. 2011; Davis et al. 2012) (Fig. 8). The World Heritage Site of Abu Mina, c. 45 km southwest of Alexandria, was investigated by a team under the direction of Peter Grossmann from the 1980s onward; Grossmann has also published details of many of Egypt's medieval churches (2002). In Middle Egypt, surveys and excavation have been undertaken at the historic monasteries in Sohag. At the Red Monastery, this work has been directed by Elizabeth Bolman and Michael Jones. At the White Monastery, work has been conducted under the auspices of the American Research Center in Cairo and Yale University, directed in stages by Bolman, Sheehan, and Brooks Hedstrom (2002–2008) and by Davis and Pyke (2008–present) (Davis et al. 2010; Brooks Hedstrom et al. 2011–2012; Davis et al. 2012). Near Edfu, the site of Hagr Edfu has been under investigation by a team from the British Museum directed by Vivian Davies and Elisabeth O'Connell since 2001 (O'Connell 2013). Other sites of importance, many of which are subject to ongoing archaeological intervention, include the Red Sea complexes of St Paul and St Anthony; Dayr al-Naqlun in the Faiyum Oasis; and complexes at Ansina, Bawit, Akhmim, Athribis, Nagada, on the West Bank of the Nile at Luxor (Dayr al-Bahri, the Monastery of Epiphanius, Dayr al-Bakhit), Esna (Dayr al-Shuhada and Dayr al-Fukhari), and Aswan (the Monastery of St Simeon, Qubbat al-Hawa), inter alia. There is more to be done in terms of integrating the evidence from such projects with those from the sites discussed previously, and comparative material studies focusing on connections, lived experience, and identity may yield results of interest in the future.

Egypt: Islamic Archaeology, Fig. 8 View west across kitchen emplacements in Room 19 of a ninth- to tenth-century residence in the Monastery of John the Little, Wadi al-Natrun, excavated in 2009–2010 by the Yale Monastic Archaeology Project. (Image courtesy of Gillian Pyke and Stephen Davis)

International Perspectives

It is sadly true of Egyptian archaeology of all periods that meaningful intellectual collaboration between Egyptian and foreign archaeologists is still the exception rather than the norm. Explanations for this can be sought in the lingering echoes of the colonial origins of archaeology in the area, for example, in the use of European languages, rather than Arabic, for the majority of archaeological publications. The internal organization of the country's own archaeological services is another significant factor. The situation has improved in recent years, although progress remains slow, with initiatives such as field schools, and the publication of the journal *Mishkah*, an outlet for research on Egyptian Islamic archaeology with papers in various languages. Participation of Egyptian scholars in conferences held in Cairo's various national research institutes has also become standard, although few are able to travel easily to events outside Egypt. Many nationalities are active in Egyptian Islamic archaeology, with France, Britain, and America particularly well represented.

Future Directions

Two aspects of archaeological research are particularly poorly represented within the field of Islamic archaeology in Egypt, both in fact reflecting the situation of archaeology in Egypt more generally. These spring from the geographical configuration and politico-administrative realities of the country, respectively. First is a lack of archaeological research into rural landscapes; and second is the difficulty in applying laboratory techniques of modern archaeological science that have become standard practice in many other parts of the world.

The intensive nature of Egyptian agriculture is inevitably destructive of archaeological traces of earlier rural settlements, field systems, and irrigation channels. Following construction of the Aswan High Dam (completed in 1971), land use in Egypt is now so intensive as to remove almost all traces of earlier activity. Some features of the countryside, however, might yield some information about earlier landscapes, if studied using geoarchaeological and geomorphological approaches; examples might include routes and roads, canals, channels, and dykes. Some attempts to reconstruct medieval landscapes have been made on the basis of historical sources (e.g., al-Nabulsi's account of the organization of late medieval al-Faiyum). The work of scholars such as Judith Bunbury and John Cooper on waterways, however, has indicated the promise of on-the-ground approaches (although Bunbury does not focus exclusively on Islamic-era landscapes). The expansion of settlements, intensification of agriculture, and subsidence of the northern Delta combine to make such research pressing. Diachronic study of Egypt's landscape might also allow critique of assumptions – on the basis of perceived rural conservatism and in the absence of direct evidence – of continuity of practice over long time periods.

In terms of the application of approaches from archaeological science, Egyptian excavation has yet to benefit from the widespread application of modern techniques. Carbon dating has been available through the laboratories of the Institut Français d'Archéologie Orientale in Cairo since 2006, but many other dating and analytical techniques are not easily achieved in the country due to a lack of facilities, nor is the export of archaeological material from Egypt currently permitted. The potential value of the application of scientific techniques to artifacts, osteoarchaeological remains, environmental samples, etc., is clear, and it may be that greater scientific collaboration between international institutions, the Egyptian Antiquities Service, and Egyptian universities is the best way to develop the possibilities for these sorts of analyses in the immediate future.

Cross-References

- ▶ Arabian Peninsula: Islamic Archaeology
- ▶ Greater Syria: Islamic Archaeology
- ▶ Iran: Islamic Archaeology
- ▶ Iraq: Archaeological Heritage
- ▶ Islamic and Crusader Archaeologies
- ▶ Islamic and Maritime Archaeologies
- ▶ Islamic Archaeology
- ▶ Islamic Archaeology and Art History
- ▶ Military Activity in Islamic Archaeology
- ▶ Orientalism: Islamic Archaeology and its Colonial Context
- ▶ Ottoman Archaeology: Localizing the Imperial
- ▶ Religion in Islamic Archaeology
- ▶ Rural Life in Islamic Archaeology
- ▶ Spain and North Africa: Islamic Archaeology
- ▶ Swahili Archaeology
- ▶ West Africa: Islamic Archaeology

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Egyptian Rock Art

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Introduction and Definition

Egypt is a land with an immense density of archaeological remains spanning hundreds thousands of years, from the Paleolithic onward. The most recognizable is the Pharaonic heritage, but a rich material legacy comes also from the

Neolithic and the Predynastic times, as well as from post-dynastic periods such as the Roman, Byzantine, and Islamic Period. Within extremely abundant archaeological findings, rock art can be easily overlooked, even though this category of remains constitutes a highly diversified and large assemblage. No doubt, rock art studies are still situated in the shadow of Egyptology, but they surely benefit from very rich contextual information provided by numerous archaeological and textual sources.

Rock art in Egypt is diversified as regards technique, subject matter, placement, and chronology. Most of rock art is either pecked or engraved onto rock surface, and only in selected areas, paintings and stencils have been recorded. Here, a very substantial distinction must be made between petroglyphs and *graffiti*, as well as paintings and *dipinti*. *Graffito* is a term used in Egyptian archaeology for a long time, referring in most cases to figural depictions and/or inscriptions executed in/on buildings (cf. Huyge 2009). However, it is not unusual for also depictions and inscriptions produced on natural surfaces to be termed as *graffiti*, which may cause a great deal of confusion. Following Dirk Huyge (2009), rock art will be understood here as depictions executed on rock surfaces, and a large corpus of *graffiti* produced on buildings is to be distinguished from them. This is also how *dipinti* should be separated from paintings, the former being placed upon man-made features whereas the latter on rocks. It is, however, of importance to note that such a division into markings executed on natural surfaces (rock art) and markings produced on man-made features (*graffiti*, *dipinti*) is a matter of convention, for it is not unusual that the same motifs occur in both contexts. It is thus possible that for ancient Egyptians such a differentiation did not exist at all. A seemingly obvious difference between rock art and inscriptions may become blurred as well. It concerns especially individual hieroglyphs and signs based on the hieroglyphic script, which have been recorded in numerous contexts, including rock art assemblages and *graffiti* on man-made surfaces. A selection of studies on such "non-textual marks" has been recently published by Haring and Kaper (2009).

Rock art in Egypt spans at least 15,000 years and was created in virtually all periods since the terminal Pleistocene (see below). Although we cannot speak about any living tradition of rock art in modern times, petroglyphs were still occasionally produced by Bedouins in the twentieth century, and quite possibly, some are still being added. Most of petroglyphs are drawn on rocks in open landscapes, usually on sandstone, but likewise on limestone and different volcanic rocks. Although caves are rare in Egypt, rock art has been also found in them, for instance, in Djara, Wadi el-Obeiyid, and the Cave of Hands (Classen et al. 2009; Lucarini 2014; Darnell 2009). Petroglyphs predominate, and there are almost no paintings reported from the Nile Valley and the Eastern Desert. The only area in which rock paintings are abundant is the SW corner of the Western Desert, where in the massifs of Gebel Uweinat and Gilf Kebir, hundreds of sites with such paintings have been discovered (Zboray 2009; Kuper 2013). We can distinguish four main rock art areas (Fig. 1):

- The Nile Valley: particularly in the Upper Egypt
- The Eastern Desert
- The Western Desert: both the oases and desert interior
- Gebel Uweinat and Gilf Kebir massifs

Rock art in each of these areas shares many commonalities with rock art corpora from other regions, but also in each of these areas, some local features can be distinguished (see below). Because it is not possible to refer to all publications reporting the Egyptian rock art in this essay, the reader is encouraged to consult other overviews (e.g., Le Quellec and Huyge 2008; Huyge 2009; Riemer 2009).

Historical Background

Rock art in Egypt has only recently started to gain scholarly attention, although its presence has been noted for 200 years. In the nineteenth century, it was usually only mentioned in reports of early

Egyptian Rock Art, Fig. 1 A map of Egypt with the rock art localities/complexes mentioned in the text

travelers and scholars journeying to different, often secluded locations (for more references, see Huyge 2009). One of the first archaeologists who turned his attention toward petroglyphs was Sir W.M.F. Petrie (1888). It was, however, the first half of the twentieth century which witnessed a gradual growth of interest in this research subject. The presence of rock art was reported, for instance, from the Eastern Desert, where it had been encountered by Arthur Weigall (1909). He found there some petroglyphs depicting boats, which, taking into consideration their desert location, was an exciting discovery. Further findings from the Eastern Desert were just a matter of time, and many more petroglyphs were shortly reported also from the interface area between the desert and the Nile Valley.

Very important research was conducted in 1926 by Leo Frobenius and his *Deutsche Inner-Afrikanische Forschungs-Expedition* to the Eastern and Nubian Deserts and the Upper Egyptian Nile Valley (DIAFE VIII). The expedition had recorded a very rich corpus of rock art, which was later analyzed and published by Pavel Červíček (1974). The Upper Egyptian Nile Valley witnessed in those times a gradual increase of known rock art sites, but most of them were discovered accidentally and usually treated as secondary to the main areas of interest of Egyptian archaeology. It was the Eastern Desert in particular which was increasingly surveyed in search of various archaeological sites (e.g., epigraphic sites, mines, ancient routes, etc.) and where petroglyphic localities were often registered as an additional element. In the early 1930s, also the Western Desert became a focus for rock art surveying, and two expeditions, again led by Frobenius, reached the isolated territories of Gebel Uweinat and Gilf Kebir (DIAFE XI and XII; 1933–1935). During one of them, the famous

Cave of Swimmers was discovered. Full of paintings, it contained anthropomorphic figures apparently depicting swimming humans. The history of one of the discoverers, László Almásy – a Hungarian aristocrat and one of the then leading experts in desert traveling – was dramatized in the movie *The English Patient* in 1996.

The first grand project (financed by Sir Robert Mond) fully dedicated to rock art was instigated by Hans Alexander Winkler who was active in Egypt in the 1930s. In 1936, Winkler (1938, 1939), interested in ethnography, religion and magic, begun his rock art survey which covered large areas in the Nile Valley (from the Qena bend southward), Eastern Desert (mainly Wadi Hammamat and Wadi Baramiya), and the Western Desert (mainly environs of the Kharga and Dakhleh oases and Gebel Uweinat). He discovered rock art representing various traditions from prehistoric, through dynastic, to Arab times, and we owe to him not only a big collection of documentation but also the first attempts at rock art periodization and interpretation. Winkler attempted at reading social and religious meanings, allegedly represented in different rock art styles. He, apparently, equaled such styles with particular societies and ethnic groups and understood rock art as kind of a self-portrait of these communities. No doubt, many of the methodological procedures behind his reasoning may be put into question today (e.g., loosely applied ethnographic analogy), but his pioneering work on both interpretation and dating of rock art has to be acknowledged. Were it not for his tragic death during the Second World War, he would have most probably published much more than his extensive reports from 1938 and 1939 and would have been able to verify some of his ideas.

After the war, the attention shifted first from the Eastern to the Western Desert. Hans Rhotert, who had taken part in the DIAFE expeditions to the Western Desert (known also as the Libyan Desert) in the 1930s, published an important book in 1952. His *Libysche Felsbilder* (Rhotert 1952) was the first comprehensive monograph dedicated to rock art and certainly contributed to elevating rock art studies to a more recognizable position in the Egyptian archaeology. The next rock art expedition to Gebel Uweinat was launched by Francis Van Noten in the winter of 1968/1969 (Van Noten 1978). His mission managed to add more rock art sites to the already known localities discovered previously by Winkler and Frobenius in the valley of Karkur Talh.

In the 1960s and 1970s, the attention of scholars was redirected toward the endangered monuments of the Lower Nubia – the land encompassing the southern limits of Egypt and the northern province of the Sudan. Rock art documentation was certainly among the priorities and has resulted in publishing several extensive catalogues (e.g., Almagro Basch and Almagro Gorbea 1968; Váhala and Červíček 1999). Although the Lower Nubian rock art is highly related to Egyptian rock art corpora, it deserves a separate entry and thus will not be discussed here.

It has been already mentioned that the documentation of 1926 Frobenius' expedition was published later by Pavel Červíček in 1974. He analyzed also part of the research material collected by Winkler, and in addition to interpretative attempts, he proposed a new periodization of Egyptian rock art (Červíček 1986). Although this chronology is disputable at some points, it still holds value and may provide a reference for any regional rock art studies. Further, however, Červíček employs an interpretative method which he calls "isochronological." The main assumption of the method is the contention that in order to interpret rock art, one should refer only to contemporary media and not to those dated from other periods. Equipped with such methodology, Červíček interpreted rock art from various (pre-)historical stages, linking it almost entirely with religious meanings and motivations. His reasoning, however, is supported also by ethnography, often fairly distant, and local archaeological sources, not necessarily contemporaneous with analyzed rock art. It may be, thus, concluded that Červíček was not rigorous enough to follow his own method. His total "religious" interpretation of Egyptian rock art met later with some criticism as being too extreme (Huyge 2009).

From the 1970s till 1990s, not many rock art expeditions were organized, and although new

findings were still reported occasionally, rock art fieldwork was relatively rare. Among the exceptions, one can count in the works of Gerald Fuchs (1989) and Lech Krzyżaniak (1990), in the Eastern and the Western Desert, respectively. Moreover, the area between Gebel Uweinat and the Dakhleh Oasis was explored by the German expedition *Besiedlungsgeschichte der Ost-Sahara* (B.O.S.) led by Rudolph Kuper. During the life of the project, many rock art sites were discovered and recorded, for instance, in the Abu Ballas and Mudpans areas (cf. Riemer 2009).

It was not until the beginning of the 1990s that rock art research in Egypt had entered a new era, marked by the increased number of projects and growing general interest in rock art studies among other scholars. In the Nile Valley itself, a very important study of prehistoric and dynastic petroglyphs was carried out near Elkab by Dirk Huyge (1995). He also conducted research on one of the Winkler's sites in the area of el-Hosh, where the first attempts at direct dating of rock art were undertaken (Huyge et al. 2001). Krzyżaniak's research in the Dakhleh Oasis continued for the whole decade, as well as the works conducted by the B.O.S. project, which was further followed by the *Arid Climate, Adaptation and Cultural Innovation in Africa* (ACACIA) project (Riemer 2009). At the turn of the century, new initiatives were undertaken in the Eastern Desert as well. The purpose was to survey vast territories between the valleys of Hammamat and Baramiya. The *Rock Art Topographical Survey* (Desert RATS) and the *Eastern Desert Survey* (EDS) resulted in publishing two volumes cataloguing hundreds of rock art sites, many previously unknown (Rohl 2000; Morrow and Morrow 2002). Although the standard of these publications is sometimes questioned, doubtlessly they still have a value as rich sources of raw rock art data, with many sites known only from these two books.

The twenty-first century has witnessed a significant increase in rock art research. András Zboray's continuous work in the Gebel Uweinat region enriched our knowledge of rock paintings tremendously (Zboray 2009, 2012). In nearby Gilf Kebir, the *Wadi Sura Project* of the Cologne University fully recorded the site of the Cave of Beasts and its environs. The applied laser scanning made it possible to publish the highest-quality catalogue documenting the entire "cave" with its ca. 8000 figures (Kuper 2013). Projects fully dedicated to rock art studies have been operating in the biggest oases of the Western Desert, for instance, in Dakhleh (Polkowski et al. 2013) and Kharga (Ikram 2009). In addition, new rock art sites were studied again by the Cologne University team of Rudolph Kuper in the Chufu area (Kuper 2014/2015) and further to the SW – in the Meri's sites (Riemer 2011) and the so-called Abu Ballas Trail. It is to be acknowledged that many of these sites were discovered by Carlo Bergmann, a solo desert wanderer (Bergmann 2011). Closer to the Nile Valley, but still in the desert, very important work was conducted by John Darnell (2002). This epigraphic research at the interface of Egyptology and rock art studies brought to our knowledge a huge number of sites located in the hinterlands of the ancient Thebes. The Western Desert rock art research has been elegantly summarized by Heiko Riemer (2009) a couple of years ago, although since then many new rock art sites have already been discovered.

At the same time, rock art findings from the Eastern Desert were more thoroughly analyzed and eventually published. Tony Judd (2009) has provided a comparative overview of the Eastern Desert petroglyphs, whereas Francis Lankester (2013) focused on analyzing particular categories of motifs, for instance, boats. A huge amount of work has been done in the Nile Valley and adjoining wadis on both banks of the river. Extremely valuable research was conducted by Per Storemyr (2009) on the so-called geometric rock art on the west bank of the Nile, in Gharb Aswan. A little bit further to the north, in Wadi Abu Subeira, multi-period rock art sites have been discovered and thoroughly recorded by the members of the *Aswan-Kom Ombo Archaeological Project* (Gatto et al. 2009). On these sites, as well as on the sites near Naq el-Hamdulab on the opposite side of the river (Hendrickx and Gatto 2009), new recording techniques have been implemented (laser scanning, photogrammetry) with a great success. Wadi Abu Subeira has been also intensively investigated by the French-Egyptian

mission headed by Gwenola Graff and Adel Kelany. During six fieldwork campaigns, they managed to record over 500 rock art stations, ranging from Epi-Paleolithic times to recent Bedouin inscriptions (Graff et al. 2015, 2018). Rock art research is still continued in the Elkab area, as well as in Hierakonpolis where a very scrupulous survey continues (Hardtke 2012). One of the biggest achievements in the Egyptian rock art studies belongs to Dirk Huyge from the *Royal Museums of Art and History in Brussels* whose research confirmed Late Paleolithic origin of the zoomorphic and anthropomorphic petroglyphs in Qurta (Huyge et al. 2011). These images, mostly "wild cattle" (aurochs), share stylistic similarities with some rock art corpora known from Ice Age Europe and for now can be considered as the oldest known petroglyphs from the entire Sahara.

State of Knowledge and Current Debates

Main Geographical Areas

Rock art has been registered in four main geographical areas, i.e., in the Nile Valley, the Eastern Desert, and the Western Desert; however within the latter, it seems reasonable to separate out two huge massifs of Gilf Kebir and Gebel Uweinat as a fourth region. All these areas differ both in terms of geography and archaeology, although they are certainly culturally related at many points, and therefore they should not be treated as archaeologically autonomous, which concerns also rock art traditions. Perhaps only the Gebel Uweinat/Gilf Kebir area can be considered as largely unrelated to the rest of Egyptian territory, as its rock art (paintings) seems to be affiliated mainly with the Central Saharan traditions.

The prehistoric rock art of the Nile Valley and both grand deserts share many similarities, although the former area is known from certain petroglyphic motifs unattested for the deserts (e.g., the Late Paleolithic imagery). The Nile Valley contains also the largest numbers of the Predynastic rock art assemblages. These, however, have been found in substantial amounts also in the Eastern Desert, and more recently they have been reported from various Western Desert sites as well (e.g., Darnell 2009; Hendrickx et al. 2009). It is the Pharaonic and Late Antiquity rock art which is widely known from all three areas; in addition the Christian and Islamic petroglyphs can be encountered there. In the deserts, these later rock art traditions are often associated with routes and related places, unless found in oases and settlements, where they can be associated also with more stationary contexts. It seems that the Gebel Uweinat/Gilf Kebir area shares with the rest of Egypt some rock art features only as regards the prehistoric traditions of petroglyphs. Rock art from later periods is largely absent there, which points to a restricted accessibility of the region after the prehistoric times (although the recently found inscription of the king Mentuhotep II Nebhepetre proves that Gebel Uweinat was known and visited by Egyptians).

Chronology

The oldest rock art in Egypt is the zoo- and anthropomorphic imagery from Qurta, el-Hosh, and Wadi Abu Subeira (Huyge et al. 2011; Storemyr et al. 2008; Kelany 2014). The main motif within this category of depictions is a auroch, but it can be accompanied by birds, fish, hippopotami, gazelles, hartebeests, wild dogs, and ibexes (Fig. 2). Animals are depicted in a very naturalistic way, which does not find parallel in later rock art traditions of the Nile Valley. In turn, some anthropomorphic figures depicted in profile are highly stylized and simplified. Many of these petroglyphs are pecked, although incised specimens also occur. They are all heavily patinated. Some of them were found as being covered by sandy eolian deposits, from which samples were obtained and OSL dated to the Late Paleolithic period, i.e., older than ca. 15,000 calendar years. Most of these depictions were found high above the current Nile level, which also points to their early dating and the so-called "Wild Nile" period, when the river was much higher than today. This category of rock art is highly distinguishable from other petroglyphic traditions and possibly related to a broader Late Paleolithic rock art phenomenon within the Old World. At the current state of research, it can be associated mostly with the Nile Valley, although a site with similar findings has been reported also from Sinai in Egypt.

Egyptian Rock Art, Fig. 2 A detail of a rock art panel at the Qurta II site, showing two superb drawings of wild bovids (*Bos primigenius* or aurochs) with forward pointing horns. (Photo by D. Huyge. © RMAH, Brussels)

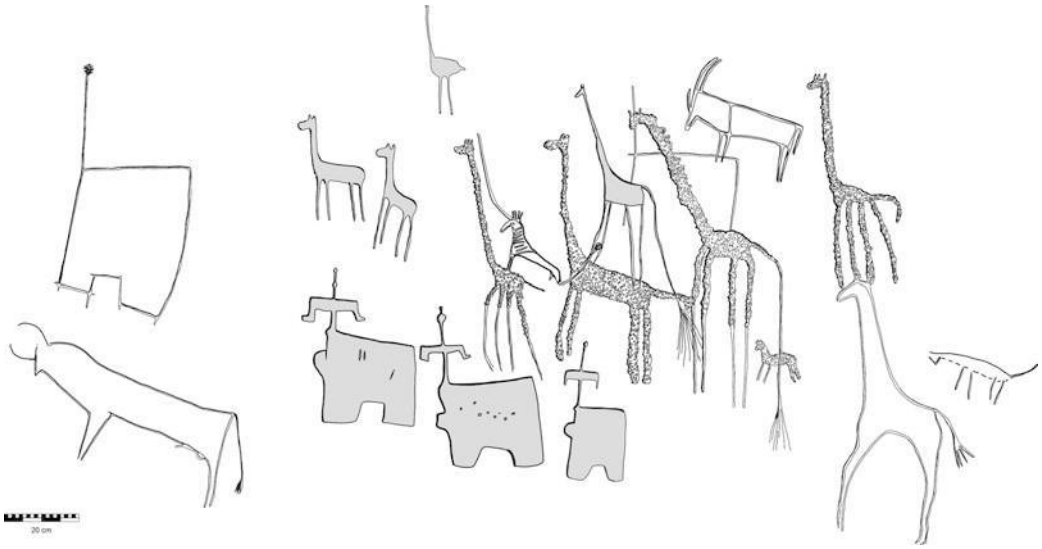
The earliest Holocene rock art is related mostly to desert areas, but sites situated close to the Nile Valley occur as well. Again, the environs of el-Hosh and Aswan seem to contain the large amounts of the petroglyphs which are usually labeled as geometric or abstract (Storemyr 2009). Among these, circles, semicircles, concentric circles, ovals, spirals, net-like patterns, and many other designs can be distinguished. This category of images contains also animal tracks and some of the meandering lines. Shapes of many figures are difficult to define, and even if they can be named, their identification remains very difficult. A very specific group of pictures consists of mushroom-shaped petroglyphs (Fig. 3) which have been identified as fish traps (Winkler 1939; Huyge 1998a). The geometric rock art can be also associated with figurative depictions, although their chronological relations are often difficult to establish. The whole group of geometric/abstract petroglyphs is considered to be dated mainly from the Epi-Paleolithic, approx. 9000 BP (Huyge et al. 2001). Similar forms have been reported from other regions as well, especially from Lower Nubia where they are considered as representing the oldest rock art horizon. They (except fish traps) are known from the Western and the Eastern deserts; however it is difficult to unequivocally deem them as Epi-Paleolithic.

Neolithic depictions constitute a large body of images, although the term "Neolithic" should not imply here agricultural societies, for between the early seventh and the fourth millennium BC, the Egyptian deserts were inhabited by (semi-)nomadic groups of "pastro-foragers." This rock art tradition is largely dominated by zoomorphic imagery (Fig. 4). In the Western Desert prehistoric rock art, known from the oases but also from much more remote places, giraffe depictions clearly prevail (Riemer 2009; Polkowski et al. 2013). These animals are usually relatively big in size (often more than a meter high), and the selected body features are usually exaggerated (neck, tail, legs). They are found both as isolated specimens and in herd-like scenes. Besides giraffes other zoomorphs are frequently encountered, such as oryx antelopes, ostriches, and gazelles. Elephants are not so common, as is the case also with other species, for instance, Addax, hartebeest, or carnivores. Some animals are depicted as associated with anthropomorphic figures. One of such archetypal motifs is a tethered giraffe which can be dated, however, also from the younger periods (e.g., Predynastic; cf. Ikram 2009). The hunting scenes are known as well (Krzyżaniak 1990), although they are rarely found. The Eastern Desert zoomorphic rock art shares many similarities with the Western imagery, but in the former area, the ratio between giraffe and elephant figures seems to be in favor of the latter species (Judd 2009).

Egyptian Rock Art, Fig. 3 Typical curvilinear "fish trap" designs and associated scenery at el-Hosh, Gebelet Jussef, Locality 1, Panel 1. The (Predynastic) animal figures located in the upper right corner are more recent in age than the rest of the panel. (Tracing by E. Marchi and I. Regulski. © RMAH, Brussels)

This mid-Holocene rock art comprises also anthropomorphs. The already mentioned human figures holding ropes attached to giraffes are usually of a very simple form. They can be stick-like figures with a few features indicated. Some of them have long penises dangling between the legs (Polkowski et al. 2013) or wield objects such as bow and arrow (Winkler 1939; Krzyżaniak 1990). A unique kind of anthropomorph is known from the area of the Dakhleh and Kharga oases and their environs (e.g., Meri, Chufu) (Winkler 1939; Ikram 2009; Polkowski et al. 2013; Riemer 2011; Kuper 2014/2015). These figures are usually shown in profile and have asymmetrical body proportion (Fig. 4). The lower parts are normally exaggerated, whereas the upper section is typically simplified or even brought to a single line. Some specimens have arms, but often these are just signaled. The same applies to the head, which can be sometimes elaborately depicted, but in most cases consists only of a simple oval element. The most intricate feature is the lower body which can be sometimes decorated with various minute geometric designs. However, the most intriguing feature is an oval element protruding from the belly, perhaps indicating pregnancy. It was already noticed by Winkler (1939) who considered these figures as representing female deities possibly related to a fertility cult. Certain scholars question this interpretation (James 2012), as some specimens do not have any features indicating sex and some are also much thinner than the rest, which may possibly refer to sex differentiation between these images.

The prehistoric rock art of the Libyan-Egyptian-Sudanese border is of a completely different character. Most of this rock art comprises of paintings, although petroglyphs have been recorded as well. Two main complexes with paintings are located in the massifs of Gebel Uweinat (Van Noten 1978; Zboray 2009, 2012) and Gilf Kebir (Kuper 2013). Although most of the imagery can be ascribed to a few motif types, such as hand stencils, human figures, wild animals, or cattle, it seems that several styles can be distinguished, and these styles may potentially bear a chronological value (Zboray 2012; Riemer et al. 2017). The most ancient style is called "Uweinat elongated roundhead" and contains anthropomorphic figures with characteristic oval-shaped heads. This feature links them with the Central Saharan rock art of Tassili n'Ajjer region, although except for some formal resemblance, further associations are rather speculative.

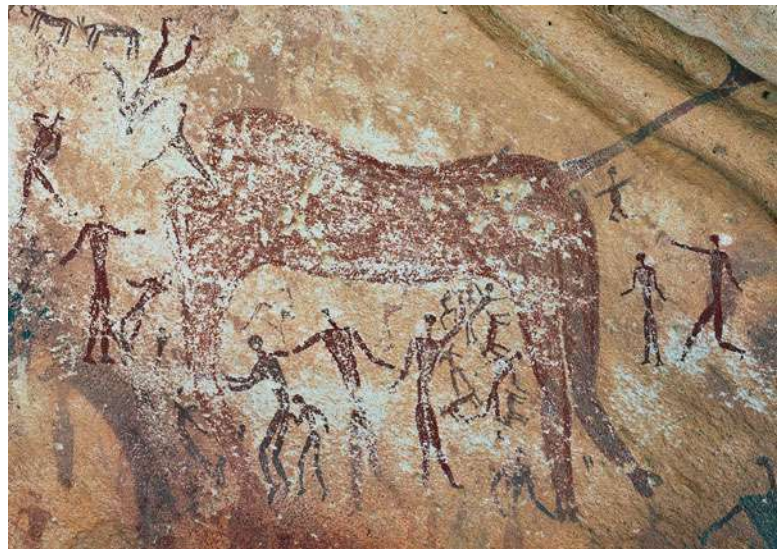


Egyptian Rock Art, Fig. 4 Giraffes and other wild animals depicted, most probably, between the sixth and fifth millennium BC. Some later dynastic figures, including the Seth animal, have been added to the prehistoric composition. Dakhleh Oasis. (The drawing by E. Kuciewicz and E. Jaroni. © The Petroglyph Unit of the Dakhleh Oasis Project)

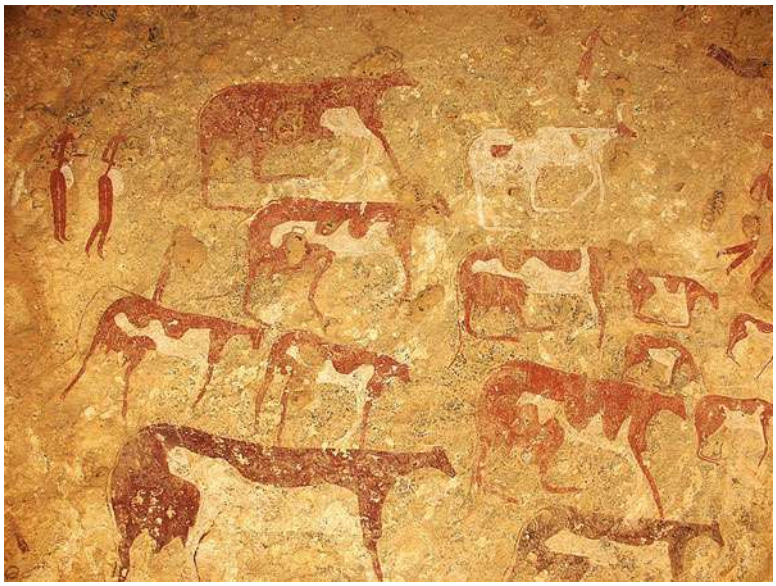
This style is associated with the seventh millennium BC and was apparently succeeded by a very similar "Uweinat roundhead" style. The main difference lies in the way the human body is rendered, in the later style being of fairly natural proportions. With the advent of the fifth millennium BC, two more styles are believed to have been used at the same time, namely, the "Wadi Wahesh style" and the "Miniature style." The first one refers to a group of human figures characterized by the presence of such features as all digits shown on the hands. The latter style, in turn, can be defined as depicting anthropomorphs drawn in much smaller dimensions, with some of the figures being of 20–30 mm height.

These styles are mostly known from the mountains of Gebel Uweinat, whereas Gilf Kebir is largely dominated by the "Wadi Sura" style paintings (Fig. 5). Named after the valley where two main (Wadi Sura I and II) and dozens of smaller sites have been discovered, this style encompasses richly decorated human figures, hand stencils, and wild animals, but also a motif not confirmed elsewhere than Gilf Kebir – the "headless beast." It was this motif which gave a name to the "Cave of Beasts" (Wadi Sura II) and which was found there in relatively big numbers. These fantastic(?) animals are characterized by having a composite body consisting of feline and possibly human body parts. The most intriguing is the lack of the head, although some of the beasts seem to devour humans. They are always depicted in profile and apparently as running. All these figures are usually involved in large compositions, in which mostly anthropomorphs are shown. These can be variously depicted and in the whole array of poses and activities. The large panel in the "Cave of Beasts" contains over 8000 figures, mostly humans, being a huge palimpsest of images, extremely difficult to interpret (cf. Förster 2013). It is believed that the "Wadi Sura style" was utilized throughout the sixth millennium BC, but its beginnings can perhaps reach also the seventh millennium BC. It is equally unclear when this style terminated, although it is fairly certain that it must have happened before the introduction of the "Cattle pastoralists" style in the late fifth millennium BC.

The "cattle pastoralists" style is the last distinctive style throughout the entire Uweinat/Gilf Kebir region (Fig. 6). The way in which human figures are rendered clearly differs from the older styles, and we witness a shift in subject matter. From now on, "cattle" is a dominant motif, and its relation with humans forms the key concept of this rock art tradition. It seems that the last paintings of this style were created approx. 3500 BC, when the environmental conditions became so harsh that breeding cattle and dwelling in this region were no longer possible. The whole stylistic division of



Egyptian Rock Art, Fig. 5 One of the most intriguing motifs belonging to the Wadi Sura style is "headless beast." Many depictions of these beasts are shown as interacting with humans, some apparently devouring the latter. (Gilf Kebir. © The Wadi Sura Project, University of Cologne)

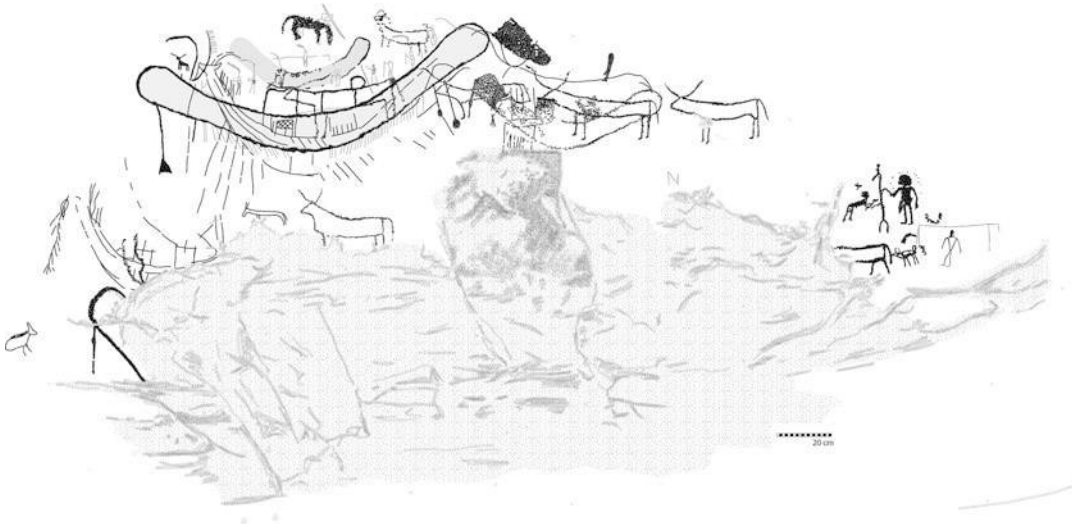


Egyptian Rock Art, Fig. 6 With the changes in economy, the past societies of Gebel Uweinat developed also a new rock art tradition, usually called the "cattle herders style." As its name indicates, the main motif of the style is cattle – depicted both in paintings and petroglyphs. (Gebel Uweinat. © András Zboray)

rock art has been recently corroborated by a thorough analysis of settlement patterns, artifact distribution, and geoarchaeological research in Wadi Sura (Riemer et al. 2017). Although some issues are still blurred, it is one of the, so far, most elaborate regional rock art periodizations, combining big amounts of data from various sources. This periodization links rock art styles with particular archaeological cultural manifestations and provides a context for rock art production in the region. It also takes into account environmental dynamics, thus providing a very broad picture of the Gilf Kebir area.

The fourth millennium BC is strongly associated with rock art production. This concerns both great deserts but even more the Upper Egyptian Nile Valley. Along with the development of the sedentary societies of the Naqada culture, petroglyphs were broadly utilized within a multitude of socioreligious contexts (Fig. 7). Doubtlessly, one of the trademarks of the Predynastic rock art is the boat motif (e.g., Winkler 1939; Červíček 1986; Huyge 1995; Darnell 2009; Lankester 2013). It has been widely recorded especially within the complex network of valleys of the Eastern Desert, in particular between Wadi Hammamat in the north and Wadi Baramiya in the south (Lankester 2013). Variability of forms is considerable. One of the main typological features is the shape of the hull, and most of the Predynastic boats can be ascribed to one of the two major categories: sickle-shaped or square-shaped types (for a more detailed typology, see Lankester 2013). Other frequently encountered features of boats include cabins, oars, standards, fronds, as well as animal-headed prows. It is not uncommon that anthropomorphic figures are depicted as crew. Among them the "dancing" figures constitute one of the most intriguing types. Such figures hold their bent arms above their heads and are often depicted as the only individual on deck. On some boats, figures interpreted as "chieftains" are also present. Sometimes they have feathers stuck in their hair, and usually they are bigger than the rest of the crew. Although several Predynastic types of human figures are known (cf. Lippiello and Gatto 2012), most of them are rather simple, often stick-like in form.

Boats can be also associated with various animal species, and some of the latter are even depicted as being transported. Among the Predynastic zoomorphic images, one can mainly distinguish the following: cattle, hippopotami, crocodiles, elephants, giraffes, asses, ibexes, antelopes, dogs, and barbary sheep. In some cases, hippopotami are depicted as being hunted from boats (Winkler 1939; Lankester 2013). Dogs chasing antelopes/barbary sheep constitute another archetypal motif of the Predynastic

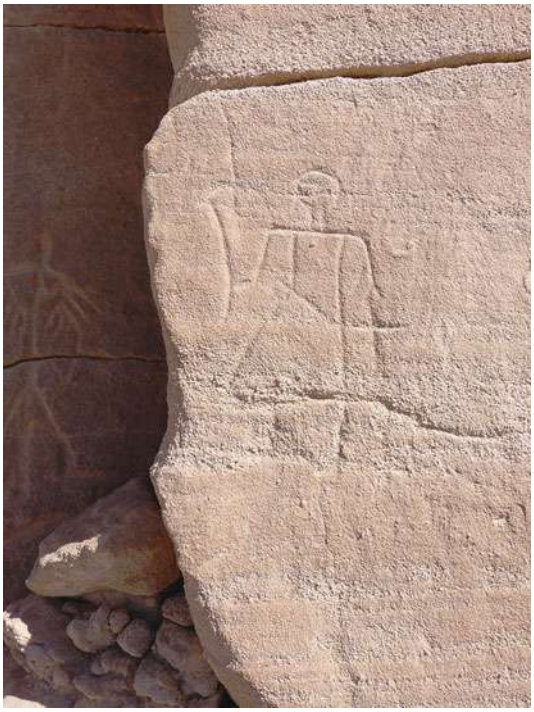


Egyptian Rock Art, Fig. 7 Predynastic rock art is dominated by boat depictions. In this case, several vessels are superimposed on each other, forming a complex palimpsest. Other zoomorphic and anthropomorphic images complete the scene. (Site EK48, Wadi Hilal near Elkab. The drawing is by J.C. Darnell and C.M. Darnell, with A. Urcia,. © J.C. Darnell, and the Yale Elkab Desert Survey)

corpus. Fine examples of it are known also from the Western Desert (Darnell 2009; Hendrickx et al. 2009). Besides the deserts, large Predynastic rock art complexes are situated in the Nile Valley, for instance, near Aswan (Storemyr 2009), Wadi Abu Subeira (Lippiello and Gatto 2012), Elkab (Huyge 2002), and Hierakonpolis (Hardtke 2012). Many of these findings are of utmost importance for understanding the social transformations which took place at the end of the fourth millennium BC. For instance, the elaborate scenes discovered on rocks in the vicinity of Naq el-Hamdulab belong to the oldest representations of royal activities (Hendrickx and Gatto 2009) and provide a unique piece of a non-formalized visual culture of the late Predynastic times.

With the advent of the third millennium BC and the unification of the Egyptian state, rock art gradually underwent a transformation in both style and subject matter. Moreover, formalization of both the hieroglyphic script and the art canon strongly influenced the way in which the more informal rock art was executed. What is important, rock depictions can now be more clearly divided into official (e.g., monumental inscriptions) and unofficial imagery. Customarily, the former belong to the domain of Egyptology, whereas the latter should constitute the object of rock art studies. Sometimes it is, however, difficult to draw a precise line between these two pictorial phenomena. For instance, many of the private depictions can be executed in a style resembling the formal iconography known from temples, tombs, or official inscriptions on rocks. Such a dilemma can occur relatively often, and it is perhaps reasonable not to adhere too strongly to such rigid divisions but rather approach the imagery, respecting the overall context of findings, even if private depictions are accompanied by official depictions and texts.

Rock art produced between the third and the first millennium BC is usually called “dynastic” (Fig. 8). Some motifs known from the earlier times are still present in the corpora, but at the same time, they seem to have undergone a kind of formal transformation. An example of such a motif is the boat, which is still frequently depicted in the deserts and the Nile Valley, but it is also relatively easy to distinguish it from the Predynastic types. Most of the dynastic boat depictions are based on real-life ship constructions, known otherwise either from the official iconography or as excavated objects. The Old Kingdom boats, for instance, usually have a steering oar at



Egyptian Rock Art, Fig. 8 An anthropomorph holding symbols of *ankh* and *was*. This piece of unofficial dynastic drawing is depicted in a characteristic style, clearly related to more formal Pharaonic iconography. (Dakhleh Oasis. © The Petroglyph Unit of the Dakhleh Oasis Project)

the back of a hull, but the shape of the oar changes with time from oval to triangle in the Middle and the New Kingdom. One of the main features distinguishing dynastic boats from the older ones is the presence of mast and/or sail, and often the most elaborate rigging and masts mark the late dynastic or even post-dynastic images. Dynastic boats occur in the Eastern Desert, although in much smaller numbers than the Predynastic vessels (Lankester 2013). They have been found in the Nile Valley as well (e.g., Huyge 1995) and also in the Western Desert, as far as the Dakhleh Oasis area. The boats can be depicted with or without a crew, often have a row of oars indicated, and similarly to the older types can have cabins or other elements on deck. Many represent river vessels, but some rock art depictions show sacred barques. Both types may be related to some actual phenomena (e.g., transport, funerals, festivals) and "mystical" meanings, such as a journey of soul after death (cf. Huyge 2002).

The repertoire of dynastic rock art is rich. We encounter depictions of various gods (e.g., Seth, Min; Polkowski et al. 2013), animals (e.g., cattle, birds; Huyge 2002), feet and sandals (Castiglione 1970; Polkowski 2018), hieroglyphs acting as various symbols (cf. Förster 2015), pubic triangles (Winkler 1939), and scenes involving anthropomorphs. Human figures have often triangular or hourglass-shaped bodies, which makes them easily distinguishable from anthropomorphs from other periods. They can be depicted as isolated figures, sometimes holding various objects or, for instance, as seating beside an offering table in an apparent funerary scene. A unique portrait of an Old Kingdom Egyptian soldier has been found in Dakhleh. The soldier is depicted along with his equipment and smelling a long lotus flower (Kaper and Willems 2002). Generally, most of dynastic anthropomorphs are stylistically referring to more official iconography, utilizing a profile view of figures and the way the body is usually rendered.

Although the transition from the Late Period to the Ptolemaic and Roman periods is very clear in terms of sociopolitical dimension, it is not so obvious within the domain of rock art. In the last centuries of the first millennium BC and the first centuries of the first millennium AD, some motifs, such as foot and/or sandal, were still produced on rocks and in even larger amounts than before (Castiglione 1970; Polkowski 2018). It is a good example of a motif which was utilized as both a temple graffito and a petroglyph, which gives scholars some possibilities to date it but also opens certain interpretative avenues due to rich contextual data originating from temples. In case of rock art, we deal with a whole variety of forms, from naturalistic representations of feet with fingers, toenails, and sandal straps to very simplified or even crude specimens. Many of the latter are depicted only in outline, devoid of any internal features, and their overall shape may be far from naturalistic or even oval. Such examples are usually considered as sandals only due to the context and accompanying figures. They can be found as isolated pictures, but often also in larger groups, which points to a repetitive usage of particular places. Sandals are nearly always executed on

horizontal surfaces, be it as rock art specimens or as graffiti on temple rooftops and pavements. Examples furnished with inscriptions can usually be dated, but because most of the petroglyphs are found without additional texts, their chronology is difficult to establish. By comparison with temple findings, it seems that most of the feet and sandals should be considered a rather late phenomenon, associated with the Late and the Graeco-Roman periods. Some examples are, however, securely dated to earlier dynastic times as well (e.g., Kaper and Willems 2002).

The Graeco-Roman and the Late Antiquity rock art is still somewhat marginalized in rock art studies (cf. Huyge 1998b). It is true that petroglyphic forms become simplified and there are fewer themes in narrative compositions, but the repertoire of depictions is still richly differentiated and the numbers of depictions considerable (Fig. 9). Anthropomorphic figures are usually reduced to a handful of lines ("match-like figures"), as are camel and horse riders, depicted in a similar way (Huyge 1998b). Some of these figures are involved in fight scenes, which was already noted by Winkler. Much of such rock art found in the Eastern Desert was attributed by him to the Blemmyes tribes (Winkler 1938, 1939).

Rock art of this time introduces also many motifs of a symbolic character, some of them pagan, like the horned altar motif, some of Christian origin, particularly crosses of various shapes. Beside the characteristic horned altars, we find offering tables and, for example, numerous signs used and executed in the Roman quarries contexts, such as in Gebel Silsila (Nilsson 2015) or in the Aswan region. This rock art horizon contains also pentagrams and swastikas, the latter in particular being related to the early Christian symbolism. Other Christian symbols, such as fish, palm frond, or *crux ansata*, belong to fairly common types of petroglyphs (Červíček 1986). Rock art of this type is well attested in the Western Desert (Kharga, Dakhleh), but it is also widely represented in other areas of Egypt. Much of the rock art is spatially related to routes linking desert localities with the Nile Valley. This also concerns some pre-Islamic Bedouin marks, which are known especially from the Eastern Desert (Huyge 1998b).

Islamic (including modern times) rock art constitutes the last stage of producing

Egyptian Rock Art, Fig. 9 Graeco-Roman rock art is a mixture of certain dynastic motifs and new influences from the Hellenistic world. On this panel from the area of Kanais (the Eastern Desert), anthropomorphs and animals, as well as Greek inscriptions, have been carefully engraved. Of particular interest is a figure of elephant – animal which used to be imported from south of Egypt in the Ptolemaic times due to its battle value. (Kanais, Wadi Abbad. Photo by Dirk Huyge)

Egyptian Rock Art, Fig. 10 Bedouin rock art of the Late Antiquity and the Islamic Period is dominated by depictions of camels and horses, often with riders. Here, a rider has been depicted as wielding a long lance and equipped with a shield(?). (Wadi Abu Wasil, Eastern Desert. © Anthony Judd)

petroglyphs in Egypt (Fig. 10). Such images are often less patinated, if at all, and were often produced with sharp tools. The figurative rock art is mostly limited to camel depictions and anthropomorphic figures (Winkler 1938, 1939). Some Bedouin petroglyphs from the Western Desert have a clear sexual character, showing humans with genitals (especially females), and even some coital scenes (Colin and Labrique 2001). Anthropomorphs are often shown with weapons, sometimes riding camels or horses. Some of such figures can be depicted as transported by ships (Winkler 1939). Narrative compositions are rather scarce, albeit scenes of fight or traveling caravans have been noted at a number of sites. Figurative rock art is often accompanied by more abstract petroglyphs – tribal marks. Such signs can have a pre-Islamic origin (Huyge 1998b), but most can be attributed to Islamic Bedouins roaming the Egyptian deserts (Harding King 1925). *Wusum*, as they are called, usually have a fairly simple form, often utilizing oval elements and linear features. However, more elaborate shapes have also been noted. Some tribal marks are identical in form to signs known from other chronological horizons, be it a six-pointed star or a cross. It is the state of preservation and accompanying features, such as Arabic inscriptions, which can ease the identification of *wusum* within the complex rock art compositions.

Key Issues and Current Debates

Egyptian rock art studies have been always preoccupied with the questions of classification and chronology, and these issues are still firmly present on the rock art research agenda. The question of chronology is approached in many ways – from subsuming rock depictions under stylistic divisions (Zboray 2012), through contextual dating (Riemer et al. 2017), and comparing imagery between different media (Hardtke 2017), to direct dating (Huyge et al. 2011). Although many rock art motifs and assemblages are still only vaguely dated, rock art chronology is much better recognized than it was only 20 years ago. Moreover, a secure chronology of rock art can potentially translate into more grounded and reliable interpretative attempts. For a long time, such efforts at interpretation of Egyptian rock art were rarely undertaken (cf. Huyge 2002), but recent years have witnessed various debates discussing other aspects of rock art than just their formal and chronological facets.

One of the most influential papers on Egyptian rock art has been published by Dirk Huyge (2002). It is a complex study of motivations directing ancient artists and meanings they invested in rock art of various periods. The strength of this work lies in its attempt at discussing some universal aspects of rock art production and appreciating at the same time the potential differences between rock art traditions of distinct times. Huyge's approach links rock art

imagery with social, political, religious, and cultural aspects of past societies and puts emphasis on historical context of any petroglyphic tradition. In that he is much more reliable than Červíček. With the help of statistical analyses, and employing some structural thinking, Huyge proposes original interpretation of (Predynastic) rock art, not only in its pictorial dimension but also within the context of its composition, placement, and socioreligious function and meaning (case study of the "Rock of the vultures"). He also suggests versatile motivations to execute rock depictions, from cosmological function of the Predynastic rock art, through more personalized, but still religious in character, dynastic imagery, to increasingly more secular rock art of later periods.

The large part of the rock art corpus analyzed by Huyge comprises of Predynastic images. In order to date and interpret them, he refers to other contemporary media, for instance, pottery decorative patterns. This method of interpreting rock art through comparison with imagery from other sources (pottery, palettes, figurines) has been used especially for the Predynastic rock art, as the Predynastic material culture offers an extremely rich and complex visual content. The method itself is not new (cf. Hardtke 2017), but it is being employed more and more often, not only for dating purposes but also in order to gain some insight into potential meanings of rock depictions. Such highly comparative study has been published by Hendrickx et al. (2009). There, they analyzed a specific motif of barbary sheep hunted by dogs, discovered on several rock art sites in the Western Desert and other media from the Nile Valley. Hendrickx et al. provided a very elaborate iconographic scrutiny, directing their interpretation toward social values of rock art in the Predynastic/Early Dynastic periods, i.e., significance connected with hunting and its role in the elites' social networks. This study not only searches for chronological links between various imageries but also recognizes a common sociocultural context in which they were utilized.

Social values of rock art production are also sought out by Francis Lankester (2016), whose case study concerns the Eastern Desert Predynastic rock art. He also is focused on linking the activities of the Predynastic elites in the desert and the phenomenon of rock depictions, especially boats and animals. In his research, Lankester refers to the anthropological notion of *rites de passage*, arguing that rock art production could have been an element of ritualistic actions performed in the liminal zones – far away from the river. Participation in such efforts would result in legitimization of the elites' status. Moreover, it would explain the presence of the specifically Nilotic imagery found deep in the desert.

The abovementioned studies pay great attention to the ideological dimension of Predynastic rock art. Furthermore, a symbolic function of images is considered especially by Dirk Huyge (2002) and John Darnell (2009). Huyge develops the concept of the solar symbolism of giraffe representations, interpreting them as the "sun bearers." Thus, for him rock art actively participated in visualization of certain cosmogonic myths and effectively contributed to the maintenance of the divine order. Darnell (2009), analyzing the Theban Western Desert petroglyphs, also distinguishes the solar ideology of giraffes and argues that it was later (during the Late Predynastic/Early Dynastic) substituted by boat imagery and linked with the royal ideology. His exegesis of the royal tableaux in the Wadi of the Horus Qa-a emphasizes the ideological dimension of rock art just before the onset of the dynastic formal iconography.

Other authors postulate also different approaches to rock art. For instance, to contest purely religious or ideological interpretation of Predynastic rock art, Rebecca Döhl (2013) proposed a functional approach. She linked environmental and climate changes in the Eastern Desert with potentially mobile character of the societies inhabiting this area. The assumed environmental and demographic pressures would be responsible for the evolvement of new ways of communication between different groups of people. Hence, rock art would become a cultural device needed, for instance, to mark special places (e.g., with resources). Such a concept does not provide, however, an answer as to why particular motifs were utilized and not the other.

Egyptian rock art has been also interpreted within the broadly understood concept of landscape archaeology. One can distinguish the contextual approach applied by Rudolph Kuper

(2013) and Heiko Riemer et al. (2017), in which landscape analysis of the Gilf Kebir rock art is equaled with studying of a distribution of other archaeological sites and artifacts, geomorphological aspects of the terrain, and overall dynamics of cultural and natural phenomena accompanying rock art in the past. A slightly different approach was presented by Per Storemyr (2009) who analyzed the prehistoric geometric rock art of Gharb Aswan in terms of its presence in various landscape contexts, not necessarily physical. He distinguished, for instance, the contexts of traveling, and special places, pointing thus toward more holistic definition of landscape. Landscape is also seriously considered by Darnell (2009) in his concept of "Niloticizing the desert." In this view, the Predynastic Nilotic themes of petroglyphs, placed upon rocks of the desert behind Thebes, served as a tool to influence the otherwise marginal landscape and its symbolic incorporation into the domain of the riverine world. Dakhleh Oasis petroglyphs have been, in turn, interpreted recently from the theoretical perspective of "rock art biography" (Polkowski 2015). In this approach, petroglyphs become analyzed diachronically, and the main focus is on their potential changeability of meanings. It helps to appreciate rock art as an enduring element of landscape and to shift attention from its primary significance toward reinterpretations in later periods.

One more type of approach to Egyptian rock art demands a brief discussion. It concerns comparative work involving two pictorial traditions clearly separated in time. Usually, it is the fourth millennium BC Predynastic rock art which is compared to visual culture of the dynastic times (an example in Hendrickx et al. 2009). Recently, however, another rock art tradition has become a subject of scrutiny involving such a comparison with dynastic iconography and textual sources – the Gilf Kebir prehistoric paintings. Several papers have been published so far in this spirit, and two of them seem to be particularly influential. In the first one, Jean-Loïc Le Quellec (2008) presents a theory that the origins of Ancient Egyptian mythology can have their roots in Wadi Sura rock art. He analyzes three categories of motifs: hand stencils, "swimming" anthropomorphs, and "headless beasts" and compares them with dynastic notions and entities related to death. He argues that Egyptian belief in caves being places for the dead people concurs with the type of localities in which the mentioned rock art motifs are usually found (such as the "Cave of Beasts"). Moreover, he likens the "swimming" figures to Ancient Egyptian *nni.w* – dead people floating in the waters of the ocean. Finally, by linking the fantastic beasts with mythical "devourers," he builds a hypothesis of the fifth millennium BC mythology expressed in Gilf Kebir rock art and still detectable in the Nile Valley in the third and second millennia BC.

The second publication is Miroslav Barta's book entitled "Swimmers in the sand" (Barta 2010). The applied methodology is here similar to le Quellec's in that he selects certain motifs or groups of motifs and compares their visual characteristics with (Pre-)dynastic iconography and textual sources. He is, however, interested not only in mythological aspects of this intercultural link but also in recognizing sociopolitical similarities in both iconographies. In that way, he is able to detect an assumed very early attestation of the "pharaoh smiting the enemies" motif in Gilf Kebir rock art, naming it a "chieftain with a mace." Barta builds upon this and other motifs a specific vision of the Wadi Sura society at the time, which was responsible for rock art production, and tries to pinpoint its similarities with the Egyptian kingdom's ruling system. By analyzing other compositions, such as the one involving a "headless beast" and anthropomorphs, he suggests also the earliest attestations of myths similar to Geb and Nut (Earth and Sky) cosmological myth. All these parallels serve as arguments in discussing the role of the Gilf Kebir communities in the genesis of the Ancient Egyptian civilization after severe climatic changes in the Sahara. Barta argues that they could have played a role in co-constituting the Badarian culture, and ideas detectable in Wadi Sura rock art could survive until the dynastic times.

These interpretations have received considerable scholarly attention and supplementary works recognizing some further potential links of a similar kind. They have also met with criticism – especially on grounds of the applied methodologies (Förster and Kuper 2013). The object of

criticism concerns mostly the lack of a rigorous comparison between different iconographies, a selective choice of motifs instead of the whole assemblages, as well as ignoring the space and, particularly, the time span between the compared image repertoires (even 4000 years). The critics signalize also that the alleged common motifs do not find their attestation in visual cultures of the fourth millennium BC, which would be expected if the concept of transferring certain images and ideas across time and space is to be regarded as plausible (Förster and Kuper 2013; Hendrickx 2015). A particularly important phenomenon has been stressed by Stan Hendrickx (2015) who has noticed that a cautious theory of Le Quellec's has been followed by a number of scholars whose approach is far from circumspect. A lack of methodological rigor in such works provokes, often justified, refutation of these concepts (Figs. 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10).

Cross-References

- ▶ Archaeology of Ancient Egypt
- ▶ Graffiti Archaeology
- ▶ North American Rock Art
- ▶ Rock Art, Semiotics and Meaning of

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El Born, Barcelona: Archaeology, Heritage, and Politics in Action

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Introduction

El Born, in its Catalan form, or simply Born, is one of the biggest and best-preserved European archaeological sites from the early modern period situated in an urban context and open to the public. It covers 8000 m^2 of the late-mediaeval and early modern city of Barcelona (Catalonia, Spain). This archaeological site has been preserved because after the War of the Spanish Succession (1701–1714), involving the Bourbon and the Habsburg dynasties in Europe and where Barcelona was the last military place to fail, the area was covered over and levelled in order to build an esplanade that connected the nearby (at that time) new Spanish citadel and the rest of the city of Barcelona. In the nineteenth century, when the citadel was not in use anymore, the original area of the old esplanade was developed with the construction of several buildings and a cast iron and glass Art Nouveau market. This market was in use until the 1970s. In 1997 the city council decided to build a semipublic library inside the market. The rescue archaeological works undertaken, however, unexpectedly uncovered a whole neighborhood in a surprisingly well-preserved state, offering a snapshot of the city in 1714. The transformation of the archaeological site into an open museum as it is now was not free from controversy. Between 2000 and 2002, the city of Barcelona had a vigorous public and media debate on whether to preserve the archaeological site in situ and open it to the public or to remove it and have the library or to have both in the same place. Later on, the debate also expanded to include the politics of nationalism, because the site is the best architectural and urban landscape record of the defeat and the consequences of the fall of Barcelona to Spain during the War of Spanish Succession, which basically meant the end of the political independence of modern Catalonia. As a consequence, the transformation of El Born into an open-site museum (2002–2013) involved the use of archaeology in an urban development environment and nationalism forces defined as in Barcelona, Catalonia, Spain.

Historical Background

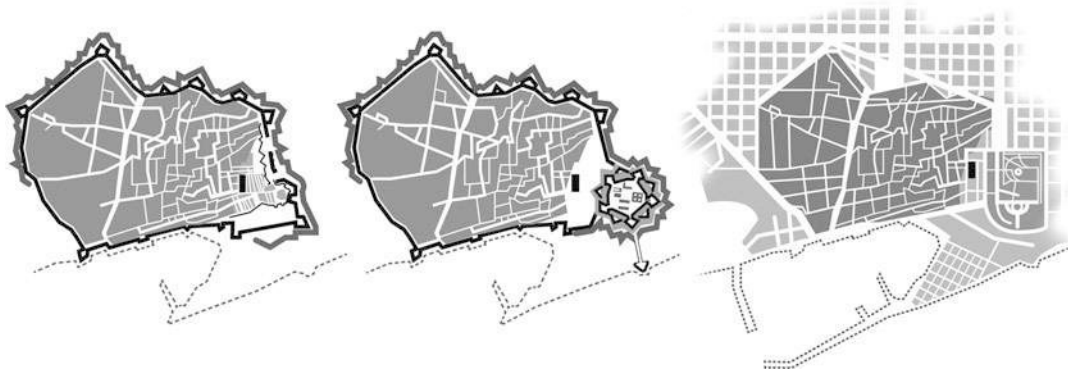
By the late seventeenth century, Barcelona had consolidated a decisive economic transformation of its region toward a proto-capitalist system of

production. In general terms, Barcelona was a prosperous, diverse, economically dynamic city connected to the world, thanks to busy trade, not only with the rest of Catalonia but also with the center of the Iberian Peninsula, the Mediterranean region, Northern Europe, and the colonies in the Americas, and through these contacts with much of the rest of the world. It was a diverse society in its origins, where it lived, and in social status and keen on imported products (especially tobacco and chocolate), religion, and festivities. In urban development terms, the city was a mixture of a trade guild-based structure side by side with the emergence of new forms of production and commerce, and within this fabric, civil authorities rubbed shoulders with religious powers and people of high social status. This is very clear in the urban fabric uncovered in El Born, where there were prosperous houses, workers' houses, small palaces, workshops, and shops belonging to a wide range of trades.

The big change to the city's makeup was caused by the War of the Spanish Succession, in which much of Europe fought for political control of the continent and consequently of trade with overseas colonies, pitting the supporters of the Austrian Habsburg dynasty (Austria, England, Portugal, and Catalonia) against those of the Bourbons (France and Spain). The final stage of this conflict was decided in Barcelona, with a siege that lasted 2 years. The besieging troops finally broke into the city through the Born neighborhood. In fact, the architectural site still contained large numbers of bombs and other Bourbon projectiles. The end of the war and the victory of the Bourbon troops led, among other things, to the physical disappearance of much of the Ribera district to build a citadel there, designed in the style of the time by the military engineer Prosper de Verboom. The fortress resulted from an intention to improve the city's defenses, but above all it was an assertion of military control of Barcelona: two of the bastions looked out of the city, one toward the sea and two into the city itself. The military complex was complemented by a surrounding area free from buildings, known as the Esplanada, which was created by demolishing a part of the Ribera neighborhood – what is known today as the Born neighborhood. Between April 1716 and July 1718, the owners of the houses situated in the area where the esplanade was to be created were forced by a royal decree to leave and destroy their own homes and to help to build the fortress. In urban terms this meant the demolition of over 1200 houses and the disappearance of 42 streets and the eviction of 20% of the population of Barcelona to other parts of the city or else outside it. The clearance also affected, on the one hand, basic city infrastructures such as the western mills and the diversion of the main water channel, so affecting the future craft possibilities of the district dependent on these infrastructures, and also the city's trade and recreational activities, of which the square known as the Plaça del Born was the nerve center. In summary, the area affected by the clearing of the Esplanada had significant repercussions on the functioning of the city of Barcelona as a whole (Garcia Espuche 2009) (Fig. 1).

Thus, the area of which the buildings preserved in the archaeological site of El Born formed part was therefore buried underneath the esplanade, which was declared to be for military use and therefore excluded from any urban development. This use was revoked in 1802, when the citadel, or Ciutadella, ceased to have any strategic military purpose, and the esplanade was gradually turned into an avenue. From the nineteenth century onward, Barcelona began a process of modernizing the mediaeval streets of the city, demolishing the mediaeval and early modern walls (from 1854 onward) and culminating in the construction of the Eixample district. One of the basic pillars of this process was the demolition of the citadel (1841), which became a large, open public park, redevelopment and building around it, and the construction of the Born market in 1878. All these changes had an enormous impact on the area's subsoil, except under the market itself, as the architecture of its structure is based on separate foundations (columns) only 60 cm deep, which did not affect the subsoil or the "fossilized" city of 1717 (Fig. 2).

In 1921 the Born market was transformed into the wholesale fruit and vegetable market of the city and remained as a wholesale market until 1971. In 1971, when the central market was moved to a bigger wholesale and distribution



El Born, Barcelona: Archaeology, Heritage, and Politics in Action, Fig. 1 Three urban and historical moments of modern and contemporary Barcelona. On the left, before 1714. In the center, mid-seventeenth century, with the citadel. On the left, mid-nineteenth century, with the Eixample district and Ciutadella Park. Marked in black is the location of Born market/archaeological site. (Author: A. Colomer-Puntés)

El Born, Barcelona: Archaeology, Heritage, and Politics in Action, Fig. 2 Interior of the Born as a wholesale fruit and vegetable market, 1930s. (Author and source: © Josep Domínguez, Arxiu Fotogràfic de Barcelona – ICUB)

center outside the city, the plan was to demolish the old Born market and build a car park. In 1977 several campaigns were launched by residents and arts associations to prevent the demolition of the Born market by stopping the market being turned into a car park and instead making it into a space for public use. This was without a doubt the greatest victory of the social movements among the citizens of Barcelona over post-Francoist town planning policies (Hernández Cordero 2017). The first democratically elected city council (1979) bowed to public demands to preserve the market, and the first architectural restoration work was carried out in 1981, though not to convert it into a center for popular culture. From this point the market hall was put to various, intermittent uses (as a venue for public concerts, popular festivities, exhibitions, and fairs) without Barcelona

City Council really knowing what to do with it in the long term. Faced by further protests and occupations of the site by residents, in 1997 Barcelona City Council finally decided, together with the Catalan government and the Spanish Ministry of Culture, to make it the home of the provincial library. This cultural equipment involved renovating and adapting the old market building and constructing three underground levels, and therefore a phase of rescue archaeology started (2001–2002) with the aim of recording and removing the site. Instead, it made even more clear the archaeological, historical, and ideological importance of the Born site. After a year of public debate over its future and 10 years of architectural rehabilitation and archaeological preservation works, in September 2013, the former Born market once more opened its doors, this time transformed into a cultural and exhibition space with the remains of the city of 1714 restored and open to the public.

The Archaeological Site

The current site has made it possible to unearth just 5% of what was lost to the Ribera neighborhood in 1717. Sixty-three houses, ten streets, the end of the water channel (known as the Rec Comtal), and a bridge, plus large numbers of sewers, have been found on the site. On the basis of the archaeological evidence, together with documentary sources, the form and content of the upper floors of the houses have been pieced together. Part of the area excavated also includes workshops and industrial establishments (tanners, furriers, dyers, weavers, and others), taverns, shops, and public gaming establishments. Chronologically, while the origin of the houses dates from the late thirteenth and early fourteenth century (though the Rec Comtal dates from the tenth century), most of the structures to be found on the site can be situated between 1650 and 1717 (Artigues and Fernández 2003). In the final phase of the site, the last 17 years, the effects of the various sieges and bombardments suffered by the city can be plainly seen, together with the rebuilding – often precarious – that took place. Finally, the site provides a highly graphic illustration of the destruction involved in creating the Esplanada: all the buildings are levelled to the same height, cut off at ca. 1.5/2 m of ground floor level. Because of this delivered destruction of the neighborhood, most valuable construction features – lintels, decorative features, grilles, doors, and so on – as well as domestic equipment still in use, do not appear in the archaeological record: residents carried off all the valuable materials to rebuild their houses and their lives elsewhere. Nevertheless, thousands of objects have been recovered and studied, mainly pottery, locally made or imported from elsewhere in the Mediterranean region, the Iberian Peninsula, Central Europe, or China. Also found were tools and equipment for farming and stockbreeding; personal items such as scissors, thimbles, earrings, rings, and the like; and craft tools such as compasses and military materials such as cannonballs, muskets, swords, and so on (Beltrán de Heredia 2014; Beltrán de Heredia and Miró 2007) (Fig. 3).

El Born, Barcelona: Archaeology, Heritage, and Politics in Action, Fig. 3 Pottery recovered in the archaeological site of El Born. (Image source: © Toni Fernández – El Born CCM)

In parallel to the archaeological site, municipal archives still preserve administrative and legal documentation dating back to mediaeval times. This has made it possible to compare all the archaeological remains and the thousands of artefacts unearthed in detail with documentary sources (Garcia Espuche 2009). It is therefore known who lived in the Hostal de l'Alba, the string makers' guild house, the apothecary Benet Mollar's shop, Josep Duran's grocery shop and what they did every day, as well as the large property owned by the Baron de Sant Vicenç, divided into four homes with the families that lived in them, and the town houses of Marianna Rosa Boixadors of Montoliu, one of them with a splendid installation for distilling spirits and rented to the Dutch consuls to Catalonia. In this respect, El Born is the finest historically documented early modern archaeological site in Europe (Fig. 4).

Key Issues/Current Debate

The importance of El Born lies primarily in the fact that the archaeological remains are unique in Europe in the way they illustrate the history of a city between the sixteenth and eighteenth century. However, the process of turning the market into a cultural center with a museum site is also of special relevance to the current debates on public archaeology in Europe and its political use. In fact, El Born is a clear example of the controversy, on the one hand, between the social and economic use of an archaeological site in a "brand" city like Barcelona, inserted in a particular model of cultural governance, heavily affected by tourism and gentrification, and on the other in the extent to which a heritage site has been the subject of ideological discourses.

When a decision was taken in 1997 to house the Barcelona Provincial Library there, a restricted architectural competition was called, and the winner was a design by the architects Enric Sòria and Rafael de Cáceres. In view of the first proposed substantial architectural changes to the original scheduled building and the insights and values of the archaeological site, it is to be asked whether the Born market was really the best place for a library (see also Riu-Barrera 2002) or whether there was an institutional interest in installing a library there while undervaluing archaeology as a tool for cultural, social, and economic development in an urban context. In fact, the 1990s and 2000s were a time marked by the creation of the so-called Barcelona model, the speculation in property development, and the exponential growth in tourism (Balibrea

El Born, Barcelona: Archaeology, Heritage, and Politics in Action, Fig. 4 The Boixadors house. (Image source: © Jordi Puig – El Born CCM)

2001; Degen and García 2012). In this context, there was a widespread view that the archaeological find was a disruptive factor in the city's economic growth and cultural development. Archaeology was an obstacle to be overcome, and rescue archaeology is the legal and proper way to remove this obstacle. The argument over the preservation or otherwise of El Born was simply a further example of this local understanding on the use of archaeology as a source for culture policy, with the peculiarity that the scale and the historical and political value of El Born reshaped the debate. Professional groups – but also municipal institutions like the Museum of History of the City of Barcelona – faced a difficult task in convincing local politicians and town planners of the economic and social value of archaeological practice (e.g., Nicolau 2002).

By 2001, as excavations progressed, the local authorities began to realize that the remains were more important than they had expected, and doubts started to emerge over whether they could be compatible with the library project. This was the origin of the idea of cohabitation between the library and the archaeological site, whereas the site was going to be the background of the library equipment. Menéndez and Pastor (2002) explain very well the correlation of forces within Barcelona City Council and the Catalan government regarding this compatibility and how their opinions were expressed in local newspapers, turning the issue of the preservation of the archaeological remains of El Born into a matter for public debate, leading to hundreds of letters to the editor. In fact, the press played a key role in this political and public debate by publishing opinion pieces by intellectuals, architects, historians, and politicians. This is a debate where party interests on the city council are openly or covertly mixed with municipal and private town planning interests, in which archaeology is always seen as an obstacle to development in the city. On the other hand, professionals in the historical field, on the other hand, see the preservation of El Born as the way to create a scientific space in which to find out more about the early modern city. Professional groups working in archaeology, conservation, museums, and mediaeval history in Catalonia called unanimously for the remains to be preserved in situ, restored, and turned into a museum site and the library to be relocated somewhere else in the city. The architects, on the other hand, were divided between those arguing for cohabitation and those preferring to relocate the library. Finally, the librarians intervened in the public debate, not to rate the architectural remains but to give their evaluation of the efficiency, or rather the inefficiency, of having a shared site. Gauging the opinions of local residents is more complex, because there are various resident associations by neighborhoods, sectors, and streets, as well as those made up of long-term residents and those of newcomers resulting from recent processes of gentrification and property speculation in the district. The final blow to cohabitation came in October 2002, when Barcelona City Council decided to conserve the whole architectural site in situ and make it into a museum space, therefore moving the provincial library to another location. This was the beginning of 10 years of building and engineering work, conservation of the site, archaeological research, and production of future exhibition spaces and equipping the site for visits by the public (Fig. 5).

During the phase of public debate about the future of El Born, a document produced by leading archaeologists, historians, architects, and museum experts proposed a particular way to present the finds by creating a new kind of cultural center, "El Nou Born" ("The New Born"), based on three principles: it should be an urban history center; it should be of a symbolic nature as a monument and memorial to urban populations who suffer wars; and it should become a cultural center (Albareda et al. 2002). The first point ties in with the desire to turn the site into a modern history center catering for new lines of research that finally discount the traditional idea of Catalonia under the Bourbons undergoing a time of economic decadence, political decline, and cultural darkness. The second thread running through El Nou Born is directly linked to the intention of the Catalan socialist party and many Catalan intellectuals to stop El Born being turned into a "mausoleum of Catalanism" (Muñoz 2002: 35) which glorified the victims of the Catalan defeat. In order

El Born, Barcelona: Archaeology, Heritage, and Politics in Action, Fig. 5 Interior of El Born CCM. (Image source: Author – © Pere Virgili – El Born CCM)

to avoid this patriotic direction, El Nou Born was to be conceived as a place to remember the everyday life in Barcelona in 1700, leaving the siege of 1713–1714 in the background. However, in order not to forget the impact of war on the site, El Nou Born was to recall what urban populations have to undergo when they are besieged and bombarded in war (e.g., Gernika 1937, the London Blitz in 1940–1941, the Sabra and Shatila massacre in 1982, and the siege of Sarajevo in 1992–1996). Finally, the third thread of the project was to define El Born as a multipurpose center for cultural activities, including commercial ones if necessary, to justify opening it to the public, hence the name "El Born Cultural Centre" (El Born CC). Under this proposal, the archaeological remains would become the setting (the backdrop) for other cultural and intellectual activities seen as more relevant to the cultural development of Barcelona. This paradox of the marginal role of the archaeological remains in the management of urban and cultural development in Barcelona once they had been saved from cohabitation was added to the fact that the promotion and conversion of El Born into a museum were to be implemented without much real regard for the site itself and the historic knowledge it offers and generates, other than to use it just to illustrate documentary sources (Hernàndez Cardona 2015; Gallego and Romero 2016: 136–138).

In the middle of the implementation of this cultural project, the 2011 municipal elections moved the administration of the city council into the hands of a center-right party professing Catalan nationalist ideas. The effect of this change was soon visible in the Born project: a new director brought a new museum discourse aiming to turn the new center into a space devoted to the Catalan patriotic epic. In fact, the ideological significance of El Born is nothing new. During the debates prior to its preservation, some intellectuals and politicians posed the patriotic value of the site as sufficient reason for its conservation (Menéndez and Pastor 2002; Gallego and Romero 2016). Now, however, the political climate had changed, and El Born became the setting of Catalan nationalism and pro-independence feeling and a place to re-establish the founding myth of the Catalan

nation (Breen et al. 2016; Gallego and Romero 2016; Hernández Cordero 2017). In this context, the resignation of the chief curator and ideologist behind El Nou Born in October 2012 also ushered in a political management of the center interested in turning El Born into the "ground zero of the Catalans" from an epic and telluric point of view (Torra 2013a, b). The signs were clear and immediate: the planned opening temporary exhibition about cast iron markets was replaced with one on the final battle and the fall of the city in 1714, entitled "Until We Prevail! The Siege of 1714"; changes were made to the panels on the rail running around the site to give more attention to the Catalans' struggle to defend their freedoms, without any direct relationship with the site itself; the exhibition and function rooms in the center were named after patriots who died on or after 11 September 1714 (e.g., Villarroel, Casanovas, and Moragues); a pole 17.14 m high with a Catalan flag was installed in front of the center; and the opening of El Born CC in September 2013 was staged to coincide with the beginning of the institutional commemorations of the tercentenary of the defeat on 11 September 1714 (see also Gallego and Romero 2016) (Fig. 6).

In 2015 the municipal elections again brought about major changes with the victory of a new left-wing political party, which rejected both Catalan and Spanish nationalism discourses. Consequently, El Born saw another ideological turnaround: new management and this time a new name, too, "El Born Cultural and Memorial Center" (El Born CCM). El Born CCM ceased to be devoted to the historical memory of the War of the Spanish Succession, now commemorating the "presence of radical movements, cultures, ethics and projects with a popular base," i.e., the people and groups who fought for democratic freedoms in the course of the twentieth century (Ricard Vinyes, in Marimon 2016). As a result of this, the first temporary exhibitions were "Franco, Victory, and Republic: Impunity and the City" and "Born Demanded, 1971–2001." In this new framework of local contemporary history, the archaeology of 1714 remains in the background, the accidental theatrical setting for other memories and other historical facts linked to political

El Born, Barcelona: Archaeology, Heritage, and Politics in Action, Fig. 6 El Born main façade. (Author: © Pere Virgili – El Born CCM)

destruction and repression in Barcelona but actively ignoring the early modern past that made it an archaeological and heritage site.

Future Directions

What makes El Born archaeologically distinctive is that it preserves a sector of the eighteenth-century city without later features to distort its conservation, destroy it, or hide the way it originally looked. Another distinctive feature is the extensive, detailed archive documentation on all parts of the area, making it possible to identify landlords and tenants by name, with details of family life, work, and trade in the neighborhood, domestic items and inventories of the shops, and so on. As well as being a place where everyday life went on, El Born is a setting affected by a long battle of historical significance for the fate of Spain and Europe and an archaeologically unique example of the subsequent repression of its new subjects ordered by the Bourbon monarchy, all in an 8000 m^2 archaeological site open to the public.

The case of El Born also adds a new factor to the public view of archaeology, as the debate on its preservation initially arose within the scope of municipal policy but was finally decided in the public arena. In this way a decision that would normally be made behind closed doors came out of the council offices to be discussed in the public context appropriate to any measures affecting heritage. However, while making El Born into a heritage site for the city was decided in the public arena, what was not discussed in public were the details of the resulting cultural project: how it was to be used as a heritage site for the city, what was to be explained there and how, and what social, cultural, and public use was to be made of it. In fact, the way it has been made into a cultural project for Barcelona has been decided in the ideological circles of the different political parties that have controlled the city council. This is why El Born suffered – and still suffers – so directly from the divisions in local and national policy: it was the subject of political debate in 1716, 1979, 2002, 2013, and 2015. Paradoxically in such an ideological context, archaeologists in Barcelona opted for a neutral, professional, and academic output, and in so doing, the archaeological site of 1714 as a heritage project today has been exploited by all city actors, those who clearly saw heritage and places for memory as the social settings for cultural and political outputs in the present.

Cross-References

- ▶ Archaeology and Politics
- ▶ Conservation and Management of Archaeological Sites
- ▶ Heritage Museums and the Public
- ▶ Museums and the Distortion of Archaeology for Political Purposes
- ▶ Nationalism and Archaeology: Overview
- ▶ Spain: Archaeological Heritage Management

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El Mirón Cave: Geography and Culture

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Introduction

El Mirón is a large cave that dominates a stretch of the upper Asón River valley at the eastern end of the province of Cantabria in northern Atlantic Spain, near the border of the Basque Country (Fig. 1). Discovered at the same time in 1903 and by the same amateur archaeologists (Hermilio Alcalde del Río and Lorenzo Sierra) as the adjacent and stylistically identical cave art sites of Covalanas and La Haza, El Mirón is at the center of a major cluster of Upper Paleolithic art and living sites that also includes such loci as Venta Laperra and other caves along the Carranza Gorge, El Horno, La Luz, and Cullalvera. The famous Magdalenian and Azilian site of El Valle, excavated by Sierra, H. Breuil, J. Bouyssonie, and H. Obermaier in 1909–1911, is about 5 km downstream. Despite its obvious potential, El Mirón was largely forgotten and was not systematically excavated until 1996, when the authors of this entry began the research in the cave. The excavations have continued ever since, revealing one of the longest cultural sequences in or near the Cantabrian region, rivaled only by sites such as El Castillo (three valleys to the

El Mirón Cave: Geography and Culture, Fig. 1 Photo of the mouth of El Mirón Cave (Ramales, Cantabria, Spain). L.G. Straus

west in Cantabria) or Isturitz (in the French Basque Country) (Straus and Gonzalez Morales 2012a).

Definition

Located at c. 260 m above present sea level and c. 100 m above the Asón at the town of Ramales, El Mirón is only 20 km from the Holocene shore (and c. 25 km from the Ice Age shore) but is surrounded by peaks and ridges of the second chain of the Cantabrian Cordillera that reach or exceed 1000 m. It is near strategic natural avenues of communication between Cantabria and the Basque County (via the Carranza Valley) and between Cantabria and the *meseta* of Old Castile (via the low [920 m] Los Tornos Pass). Access to the central sector of Cantabria, with its concentration of Upper Paleolithic sites on the coastal plain near Santander (e.g., Morín, El Pendo, El Juyo, La Garma) and in adjacent montane valleys (e.g., El Rascaño, El Salitre, Monte Castillo), is also relatively easy via 675 m Alisas Pass between the Asón and Miera valleys – visible from El Mirón. There is a cluster of Upper Paleolithic and Mesolithic sites near the present mouth of the Asón, El Otero, La Chora, Cobrante, El Perro, and La Fragua, plus several sites (notably Cofresnedo, Cubio Redondo, Patatal, and Los Emboscados) in the polje of Matienzo that lies not far inland. El Mirón faces due west and looks out from a steep cliff side at the pyramid-shaped San Vicente Peak (reminiscent of Monte Castillo, which contains the cave sites of El Castillo, La Pasiega, Las Chimeneas, Las Monedas, and La Flecha). The accessible part of this simple, straight, single-chamber cave is some 130 m deep. Although there are archaeological remains (including Magdalenian evidence) in the dark inner cave, the excavations have concentrated on the rich deposits in the sunlit vestibule, which measures 30 m deep × 8–10 m wide and 12–13 m high (with the mouth itself being 19 m high and 16 m wide). The sedimentary infilling (up to 9 m deep according to ground-penetrating radar and other remote sensing methods and coring) records a very long sequence of depositional agencies and late Pleistocene climate changes (Courty and Valleverdu 2001; Ellwood et al. 2001; Straus et al. 2001).

Key Issues

González Morales and Straus have conducted excavations in El Mirón since 1996, mainly in the vestibule (although they also found traces of early Magdalenian occupations in the dark cave interior and in the narrow ramp gallery that connects it with the vestibule). The vestibule excavations have consisted of two 9–10 m^2 block excavations (the outer vestibule cabin and inner vestibule corral areas) connected by a 9 × 1 m trench with a deep 1 × 1 m *sondage* at its midpoint, plus a 4 × 1 m trench dug below the base of a looters' crater at the base of the ramp at the vestibule rear that is connected to the NE corner of the corral area, and a 2.5 m^2 excavation area that is connected to the SE corner of the corral area between a huge decorated block and the rear wall of the cave vestibule. There are now 90 radiocarbon dates (AMS and conventional) from the site (Straus and Gonzalez Morales 2003, 2007a, 2010, 2016; Straus et al. 2015b).

The composite cultural sequence revealed by these excavations in various sectors of the cave and dated by radiocarbon is as follows:

Late Mousterian, >45,000, 48,200 ± 3300, 41,280 ± 1120 BP (all dates, uncalibrated): ramp base
Gravettian, 27,580 ± 210 BP: ramp base
Solutrean, 20,440–18,390 BP: corral and ramp base
Initial Magdalenian, 17,400–16,080 BP: ramp, corral, mid-vestibule, cabin
Lower Magdalenian, 15,700–14,600 BP: inner cave, corral, behind block, mid-vestibule, cabin
Middle Magdalenian, 14,850–13,490 BP: corral, behind block, mid-vestibule, cabin
Upper Magdalenian, 12,970–12,460 BP: corral, mid-vestibule, cabin
Final Magdalenian/Early Azilian, 11,950–11,205 BP: corral, mid-vestibule, cabin
Azilian, 10,740–10,270 BP: ramp, mid-vestibule, cabin
Mesolithic, 9550–8380 BP: corral, mid-vestibule, cabin
Neolithic, 5790–4680 BP: mid-vestibule, cabin
Chalcolithic, 4120–3820 BP: cabin
Early Bronze Age: 3700–3230 BP: inner cave, cabin

In addition, there are traces (torches?) of Medieval visits to the cave (CE 1100–1400), as well as ample evidence of recent occupations by humans and/or their livestock up until the time the excavation began.

The Mousterian and Gravettian are attested by very small numbers of scattered, banal lithic artifacts (flakes and a few notches/denticulates in the former; flakes and blades – including a few retouched ones – in the latter), together with dispersed charcoal fragments and faunal remains (essentially red deer and ibex, plus lion identified by A.B.. Marín in the Gravettian). Hominin visits to the cave (or at least to the vestibule rear) were ephemeral, but carnivore activity was significant.

The cold, dry conditions that developed during the course of the Gravettian-age deposit (evidenced by pollen analyzed by M.J. Iriarte (Straus et al. 2011b) and rodents studied by G. Cuenca-Bescós (2008)) continued into the overlying Solutrean sequence, with open landscapes dotted only with some pine trees. Humidity increased in the later Solutrean levels with the addition of birch and more heaths, grasses, and ferns. The light-colored clayey/sandy silt Solutrean levels, banked up against the base of the colluvial-alluvial erosional ramp that leads up to the inner cave, show some increase in the intensity of use of the cave by humans but probably for very limited purposes. The density of artifacts and bones is low, and there are no hearths or other features in the 4–5 m^2 in which the Solutrean has been excavated. There are relatively few lithic debris (especially cores and other primary débitage items, although micro-débitage is abundant), limited numbers of retouched tools (notably continuously retouched pieces, denticulates/notches, sidescrapers, simple angle burins, and backed bladelets), but relatively many Solutrean points (almost all broken) of various types and made on diverse raw materials, some rather colorful and from nonlocal sources probably near the Vizcayan and/or Santanderine shores. Alongside the points (shouldered, laurel, and willow leaf, unifacial, and concave base), there are consistently perforated objects, especially marine shells, but also teeth (red deer canines) and bones. A few *sagaies* have been found, including one with a long bevel or tip decorated by numerous, fine, oblique engraved lines. In addition to remains of red deer and ibex, there are also fish bones and a few unperforated mollusk shells. A plausible hypothesis is that the cave was used for repeated hunting expeditions in the montane zone under still-rigorous, though attenuating climatic conditions apparently right before, during, and right after Greenland Interstadial 2 within the Last Glacial Maximum in sensu lato (Straus and Gonzalez Morales 2009; Straus et al. 2011b).

The transition to the Initial Magdalenian occurred sometime around 17,000 BP (uncal.) during early Oldest Dryas (Straus and Gonzalez Morales 2012b). The most notable change within the context of El Mirón is the fact that these dark gray-brown silty loam levels (richest by far at the foot of the ramp) now lie relatively flat and are dense in lithic and osseous artifacts of many kinds, faunal remains, remnants of hearths (abundant charcoal, burnt flints and bones, actual fire pits, fire-cracked rocks), thin patches of pigment. *Sagaies* are numerous and include a wide range of sizes and sections. The lithic assemblages include both large flakes and flake tools (scrapers, denticulates, notches) on local raw materials (quartzite, mudstone, limestone) and smaller implements (including backed bladelets) made on good-quality flint, apparently from nonlocal, coastal sources. Assemblages characterized by macroliths on non-flint materials have been found in other early Magdalenian (and Solutrean) contexts in Cantabria and Asturias. There are several large, round-section antler points along with oval-section ones (Straus et al. 2014). Classic diagnostic "fossil director" artifacts of the French Badegoulian are very rare or absent. Remains of red deer, ibex, and salmon are abundant. The basal Initial Magdalenian level yielded a broken (unfinished?) pendant with a fine engraving of a horse head on a slate-like rock of possibly local provenance (González Morales and Straus 2013).

The classic Lower Cantabrian Magdalenian is extremely well represented in El Mirón. Still cold, the landscape was dominated by grasslands and heaths, with scattered pines, junipers, birches, and some hazels in the latest times (Iriarte et al. 2015). The cave seems to have been entirely and intensively used by humans during repeated, relatively long-term, multifunctional occupations, possibly

during the warm season. The deposit is a veritable horizon of dark chocolate brown color, rich in charcoal and other organic matter, hearths with fire-cracked rocks (attesting to stone-boiling and probably bone grease extraction as part of hearth-centered activities; Straus and Gonzalez Morales 2007b; Nakazawa et al. 2009), vast quantities of red deer, ibex, and salmon remains (Consuegra et al. 2002; Cuenca-Bescos et al. 2012), lithic debris and retouched tools, antler *sagaies* (round, quadrangular, oval, centrally flattened sections, single-bevel base, sometimes geometrically decorated), bone needles, perforated animal teeth and shells, etc. The lithic tools are heavily dominated by backed bladelets (presumed projectile weapon elements), but there are also many so-called nucleiform endscrapers (bladelet cores for prolific bladelet production that may occasionally have also been used as scrapers (Straus et al. 2016) and the usual retouched blades, notches, denticulates, and sidescrapers, plus smaller numbers of perforators and burins (Straus et al. 2008). High-quality flints from Upper Cretaceous flysch sources along the present shore near Bilbao and Santander dominate the lithic assemblages and attest to visits, stays, and/or social contacts at the coast. However there are also flints from more distant outcrops in extreme SW France and the trans-Cordilleran interior Basque region/Navarra, suggesting long-distance trade and/or collection trips (Fontes et al. 2015, 2017). Together with several engraved fragmentary pieces, an essentially whole, large red deer stag scapula with the striated engraving of a red deer hind head and neck followed by the engraved outline of a possible bovine was found in this horizon (Gonzalez Morales et al. 2007). It is almost identical to other such pieces that have been found since 1902 (first by Alcalde del Rio) at other Lower Magdalenian sites in Cantabria and eastern Asturias (notably at El Castillo, Altamira, and El Juyo). As first noted by Breuil, these images bear strong technical and stylistic similarities to striated engravings (especially of hinds) on the cave walls of caves such as Altamira, El Castillo, Llonín, etc. The Lower Magdalenian horizon also yielded an iron oxide pebble with a fine reticulate engraved design and *Homalopoma sanguineum* and *Cyclops* shells from the Mediterranean, as well as relatively numerous shells from the Cantabrian Sea (Gutiérrez-Zugasti and Cuenca 2015). Despite the presence of regional territorial stylistic markers (the engraved scapulae), this horizon yielded another possible piece of evidence of participation in long-distance social contacts: a distinctive, thin spear-thrower that is almost identical in its size, shape, and proportions to three others of similar age from the sites of Le Placard and Roc de Marcamps in west-central France (Gonzalez Morales and Straus 2005, 2009). A grooved reindeer incisor (at this time the only evidence of *Rangifer* at El Mirón according to J.M. Geiling) also suggests ties to reindeer-rich Roc de Marcamps, where there are several such ornaments.

It was near the beginning of this period that a very large block fell from the ceiling of the vestibule rear, landing with its eroded outer surface atop Level 110. The flat, sheared-off inner surface, oriented toward the cave mouth and hence the sunlight, was engraved soon thereafter with two series of (deep and wide, shallow, and narrow) lines (some of which might represent hands and fingers) (Gonzalez Morales and Straus 2015). (There are other fine engravings – including one of a horse – on the rear wall of the vestibule, probably also dating to the Lower-Middle Magdalenian; Garcia Diez et al. 2012.) Behind this block, in the c. 1 m space between it and the rear cave wall, partly atop a bedrock ledge that had been hit by the fallen block and partly in a pit dug into a preexisting Lower Magdalenian level, the remains of a partial human skeleton (notably lacking its cranium and most major long bones) were buried (Straus et al. 2015a). The bones (including a complete mandible with teeth and one maxillary incisor) are stained with red ocher, the back (eastern) face of the block adjacent to the burial is also so stained, and the level in which the human remains were buried was also stained red and speckled with hematite crystals probably from a source on the present coast at the mouth of the Asón (Seva et al. 2015). The burial level is under- and overlain by fire lenses. This burial – the first one of Magdalenian age to be found on the Iberian Peninsula – was a reworked primary interment apparently done in a highly ritualized context, as manifested notably by the engraved and painted block which may have served as a grave marker (Straus et al. 2011a, 2015; Gonzalez

Morales and Straus 2015). Analysis of the skeletal remains reveals that the individual ("the Red Lady of El Mirón") was a robust female, 35–40 years old, in good health (Carretero et al. 2015) who had a diet of mostly terrestrial mammals (mainly ibex and red deer) but also c. 20% marine foods, plus some plant seeds and mushrooms (García-González et al. 2015; Power et al. 2015; Marín and Geiling 2015). Mitochondrial and nuclear DNA analyses have shown that this individual was part of a human population that had abandoned northern Europe during the Last Glacial Maximum and then recolonized it during Oldest Dryas and the Tardiglacial (Fu et al. 2016), in support of long-standing archaeological arguments by Straus (e.g., 1991, 2000, 2013) and others. The El Mirón stratigraphic sequence also provided evidence that the Cantabrian region was a refugium for both salmon and red deer during the pleniglacial period (Consuegra et al. 2002; Stevens et al. 2014).

The Lower Magdalenian levels grade rather imperceptibly into layers that are dated to the Middle Magdalenian time range. The lithic and osseous artifact assemblages are generally similar, but there are markers of neither the Cantabrian Lower Magdalenian nor the classic Pyrenean Middle Magdalenian (notably *contours découpés* or perforated bone disks) which have been appearing with increasing frequency in recent excavations of Cantabrian sites (e.g., Las Caldas, La Viña, Llonín, Tito Bustillo, El Juyo, El Linar, La Garma, Ekain). Somehow El Mirón (or at least the small part of the site that has been excavated) failed to receive such "calling cards" from the wider Magdalenian world at this time. However there is a short, longitudinally grooved antler point with a single-bevel base that resembles a Lussac-Angles *sagaie* – an artifact type diagnostic of the early Middle Magdalenian of France. People repeatedly and intensively occupied the cave (as before) mainly during the warm months, hunting red deer and ibex (according to analyses by A.B.. Marin 2010) and fishing salmon. The artifact assemblages contain abundant backed bladelets and *sagaies*. Periods of abandonment are suggested by rodent and raptor activity.

The Upper Magdalenian represents a significant break in the nature of human use of El Mirón. The levels are thinner, poorer, and discontinuous. The Late Glacial trend toward increased woodlands and humid meadows in the vicinity of the cave began at this time would be briefly interrupted during Youngest Dryas (corresponding to the Azilian), and mixed deciduous forestation would become dominant in the early postglacial (Cuenca-Bescós et al. 2008). The red deer- and ibex-dominated faunal assemblages attest warm-season visits to the cave, now without the abundant hearths of the earlier Magdalenian levels. The artifacts continue to include many backed bladelets and backed micropoints, as well as *sagaies*. There is one fragment of a unilaterally barbed antler harpoon closely associated with charcoal dated to 12,970 ± 70 BP (uncal.). During the terminal Late Glacial, human settlement in the Upper Asón seems to have been concentrated in caves at the base of this valley and that of its Río Calera tributary immediately east of El Mirón: El Valle, Cullalvera, and El Horno, all with Upper Magdalenian and/or Azilian materials.

The following Upper Paleolithic levels are difficult to assign to either the Terminal Magdalenian or Azilian. They date between 11,950 and 11,650 BP but with some incoherency. True "fossil directors" are absent from the small assemblages, but there are curved backed "Azilian" points, thumbnail endscrapers, and an elongated pebble stained with red ocher (Gonzalez Morales and Straus 2012). These levels are thin and discontinuous, with evidence of warm-season hunting of red deer and ibex according to A.B.. Marin (2009, 2010). Levels with unambiguously Azilian-age dates are unfortunately even less well defined in terms of artifacts, although lithic Azilian points and thumbnail endscrapers are also present. The presence of c. 10,500 BP dates in a small remnant of breccia (with only a few visible flakes and bones) under a travertine adhering to the cave wall at the top of the ramp suggests that there may have been a more extensive Azilian occupation at the western edge of the inner cave that was lost to erosion (possibly including the movement of humans and livestock) during the Holocene. This Azilian episode seems to have been followed by virtual abandonment of the cave, with only occasional, ephemeral visits by humans who left scattered flakes and faunal remains during the course of the Preboreal. Mesolithic occupation of the region was highly concentrated along the shore as this

essentially reached its present position and as the interior became densely forested. El Mirón only became a significant human residence again in the Early Cantabrian Neolithic, c. 5700 BP, with evidence of domesticated wheat (Peña-Chocarro et al. 2005), sheep/goats, cattle, and pigs (Altuna and Mariezkurrena 2012), along with locally made, high-quality ceramics (Vega 2012). Intensive occupation by people and their livestock continued throughout the Chalcolithic and early Bronze Age, with many hearths, pits, and other anthropic features (Straus and Gonzalez Morales 2012c).

Cross-References

- ▶ Altamira and Paleolithic Cave Art of Northern Spain
- ▶ Art, Paleolithic
- ▶ Dating Methods (Absolute and Relative) in Archaeology of Art
- ▶ Europe: Mesolithic-Neolithic Transition
- ▶ Europe: Paleolithic Art
- ▶ Europe: Prehistoric Rock Art
- ▶ European Upper Paleolithic Rock Art: Sacredness, Sanctity, and Symbolism
- ▶ Geoarchaeology
- ▶ *Homo sapiens*
- ▶ Human Evolution: Use of Fire
- ▶ Hunter-Gatherer Settlement and Mobility
- ▶ Hunter-Gatherers, Archaeology of
- ▶ Iberian Mediterranean Basin: Rock Art
- ▶ La Riera Cave: Geography and Culture
- ▶ Lithic Technology, Paleolithic
- ▶ Radiocarbon Dating in Archaeology

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El Pilar

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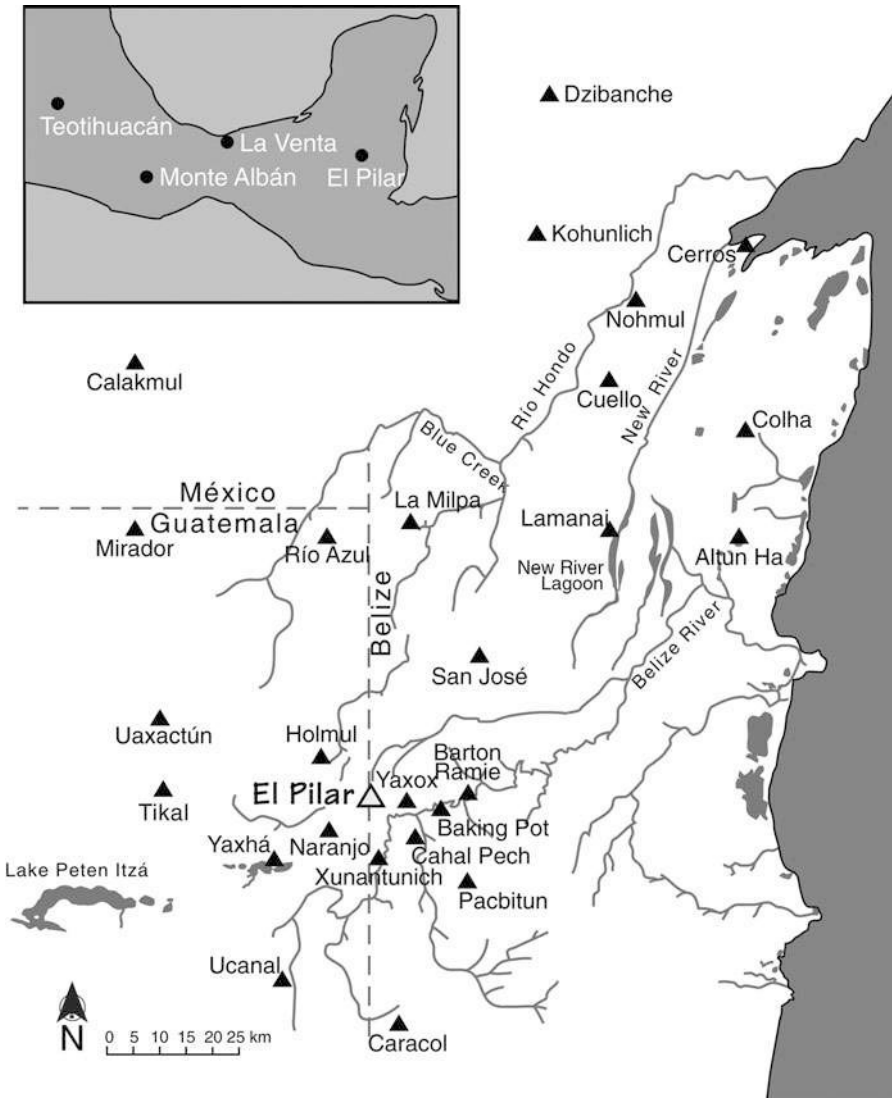
Introduction

El Pilar is a major Classic Maya center situated on an elevated limestone escarpment in western Belize, comprising a monumental architectural core and surrounding zone of dense residential occupation. The rediscovery of El Pilar in 1983 provides an opportunity to evaluate ancient Maya settlement hierarchies in the eastern Maya Lowlands (Fig. 1), challenging prevailing assumptions of a ribbon-like settlement pattern – matching the sinuous Belize River system (Flannery 1972; Hammond 1981) – and the importance of rivers in determining site location in western Belize. The ribbon settlement model derives from the work of Willey et al. (1965) in the 1950s, which documented the distribution of residential units and small ceremonial centers along the Belize River. The idea that proximity to water provided households with advantages to fulfill subsistence and transportation needs was central to the river-focused view of settlement in western Belize. Nevertheless, many major centers were located far from perennial water sources, and proximity to water was not a requisite for permanent settlements. proximity to water is not a requisite.

Archaeological surveys located sites along the Belize River (Willey et al. 1965), yet no surveys had systematically investigated the northern ridge-lands, which were strikingly similar to environments of the greater Petén surrounding Tikal 50 km to the west. The noted lack of surface water did not deter the ancient Maya from establishing numerous settlements and centers around Tikal, and this landlocked interior area shows evidence of occupation spanning the entire sequence of Maya social development from c. 800 BCE to 1000 AC and beyond (Table 1; Puleston 1973; Ford 1986). The question of whether interior settlement patterns prevailed in the ridge-lands east of Tikal, or if settlement patterning was noticeably affected by proximity to the Belize River, remained unanswered for decades. The idea that surface water flows may well be an obstacle to settlement in the Maya Lowlands – an area that receives an average of 2000 mm of rain per year and experiences tropical storms and hurricanes on a regular basis – remained largely overlooked.

Survey has been aided by the fact that the Maya forest has seen little infrastructural development since the neglect of Maya centers around 1000 years ago. While historic activities such as lumbering, chicle sap extraction, and xate palm collection, along with sporadic agricultural pursuits and looting, have impacted natural resources in the area, the marks of these activities on the terrain are slight. Surveyors in the Maya



El Pilar, Fig. 1 Central Maya Lowlands with El Pilar indicated

El Pilar, Table 1 Occupation chronology: El Pilar of the Maya Forest

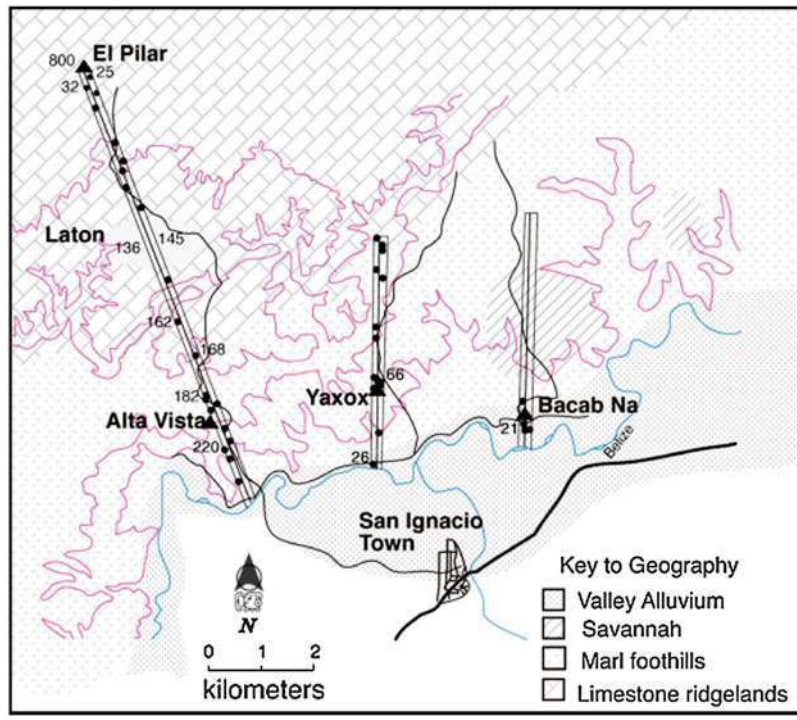
Common era	2000–1000 BCE	1000–250 BCE	250 BCE–250 CE	250–600 CE	600–900 CE	900–1100 CE	1100–1500 CE
Human ecology	Early settlement	Emergent Preclassic centers	Civic center expansion	Center and settlement stability	Civic center growth	Civic center demise	Settlement refocus
Land use	Initial Settled forest gardens	Established forest gardens	Expanding milpa forest gardens	Stable milpa forest gardens	Intensification of milpa forest gardens	Retreat to milpa forest gardens	Dispersed milpa forest gardens
Cultural period	Formative Preclassic	Middle - Late Preclassic	Late Preclassic	Early Classic	Late Classic	Terminal Classic	Early Postclassic

forest will encounter remains of the ancient Maya in all the well-drained zones. Today, LiDAR coverage is revealing large and small settlements throughout the region.

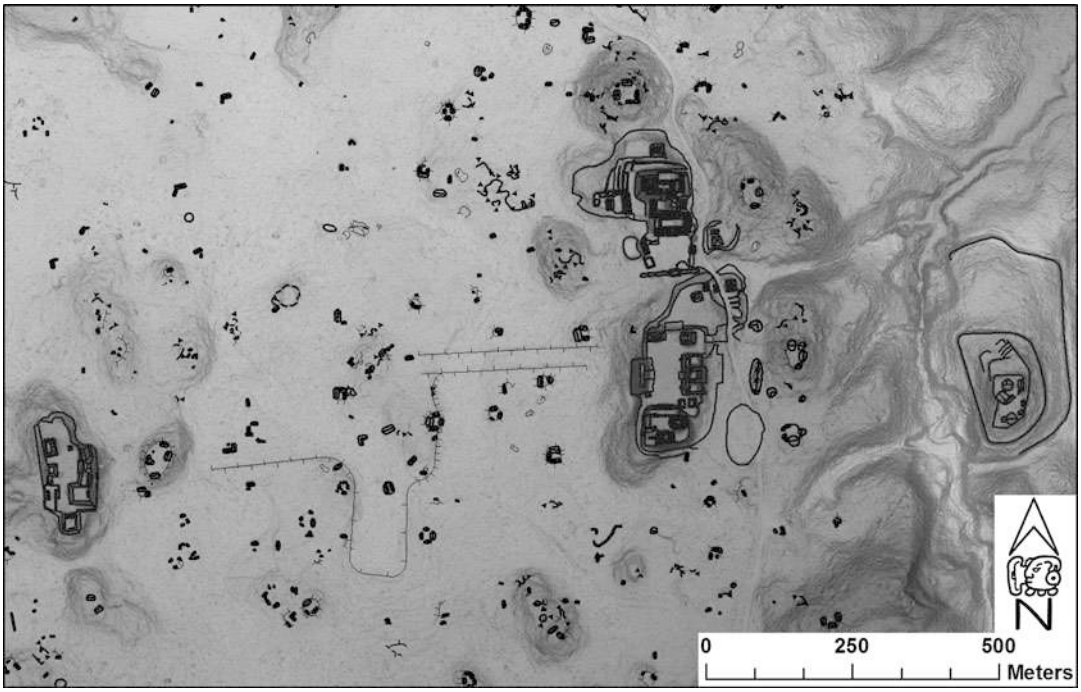
Archaeological survey north of the Belize River was certain to encounter El Pilar, now known as the dominant Maya center in the area. The Belize River Archaeological Settlement Survey (BRASS) sought to examine settlement patterns and household belongings between the river and the northward limestone ridges, thereby assessing the influence of river and ridge-land on ancient occupation (Horn and Ford 2018). El Pilar dispels the myth of river attractions with its ridge-land location, but this does not undermine the importance of water for the Maya (Ford 1996). The Maya developed sophisticated methods for harvesting water and managing its flow, as revealed by reservoirs systematically associated with monumental architecture and complex drainage systems across the region (Ford 1986; Scarborough 1998). Flooding would have been a problem for settlements near small or large waterways, however, which is attested in the predictive model of Maya settlement developed from BRASS survey data (Fig. 2): residential units were rarely closer than 500 m from any drainage (Ford et al. 2009).

Background

The core area of El Pilar comprises greater than 150 ha of architectural monuments distributed over 2 km of eastern Belize to western Guatemala (Fig. 3), demonstrating the international quality of these ancient monuments in the contemporary world. Ongoing, detailed field surveys aim at identifying minor monumental architecture in the peripheral areas surrounding the center. Situated at the eastern edge of the uplifted limestone ridgelands that typify the interior of the greater Petén, El Pilar sits about 265 msl on a 400-meter escarpment that rises north from the Belize River and dominates the horizon from the north and east. Today, it lies beneath a verdant canopy and is dramatically visible from the foothill community of Spanish Lookout to the east.



El Pilar, Fig. 2 The Belize River area showing the BRASS Transect Surveys that located El Pilar



El Pilar, Fig. 3 Core area of El Pilar from the Citadel on the East to Pilar Poniente on the West

Massive in presentation, the monumental core of El Pilar is a mere 10 km from the Belize River and less than 50 km from Tikal. The first maps from 1984–1986 registered 65 looter's trenches, some of which were expanded before intensive archaeological fieldwork began in 1993. Subsequently, it was declared a reserve in Belize and Guatemala.

The El Pilar program, directed by Anabel Ford from the University of California Santa Barbara, assessed the extent of the site for 12 years, determining that an offset causeway linked the east and west monumental architectural areas that lie in contemporary Belize and Guatemala. The acquisition of LiDAR (Light Detection and Ranging) data in 2013 revealed details of this causeway system (Ford 2014) and facilitated the recording of extensive monumental architecture beyond the original mapped areas, particularly to the northwest in Guatemala.

Decades of research at El Pilar fostered several partnerships between archaeologists and local organizations. Critical alliances with the Belize Tourism Industry Association, a Non-Government Organization (NGO), and the Government of Belize were developed to define the reserve boundaries on the east and protect significant monuments. These partnerships set the stage for the unique conservation program called *Archaeology Under the Canopy*: an important initiative that incorporates the environmental context of monumental architecture and engages with the Maya forest to safeguard its unique qualities and the culture of its inhabitants.

The essential need for collaboration with the governmental and nongovernmental agencies, community-based organizations, and archaeologists in Belize and Guatemala led to the creation of the Mesa Redonda El Pilar. The Mesa Redonda process was designed to establish a foundation for binational cooperation and promote the importance of the culture and nature of the Maya forest. Government authorities and nongovernmental agencies, as well as community members in both Belize and Guatemala, together engaged in a management-planning process designed to be implemented in both countries (MARC 2016). This process engendered an inclusive community participation program that continues to grow today.

Archaeological fieldwork at El Pilar encompasses a multiyear survey and excavation program that has produced significant results for understanding the local and regional development of Classic Maya society. Chronologies from ancient monuments at El Pilar and local residences provide a solid foundation for exploring regional-scale settlement patterns (Egerer 2008; Ford 1985, Lucero 2001; Pagliaro 2011), but the impact of developments at El Pilar, a large and powerful center, and its relationships to smaller Belize River sites has not been fully explored.

El Pilar Excavation Overview

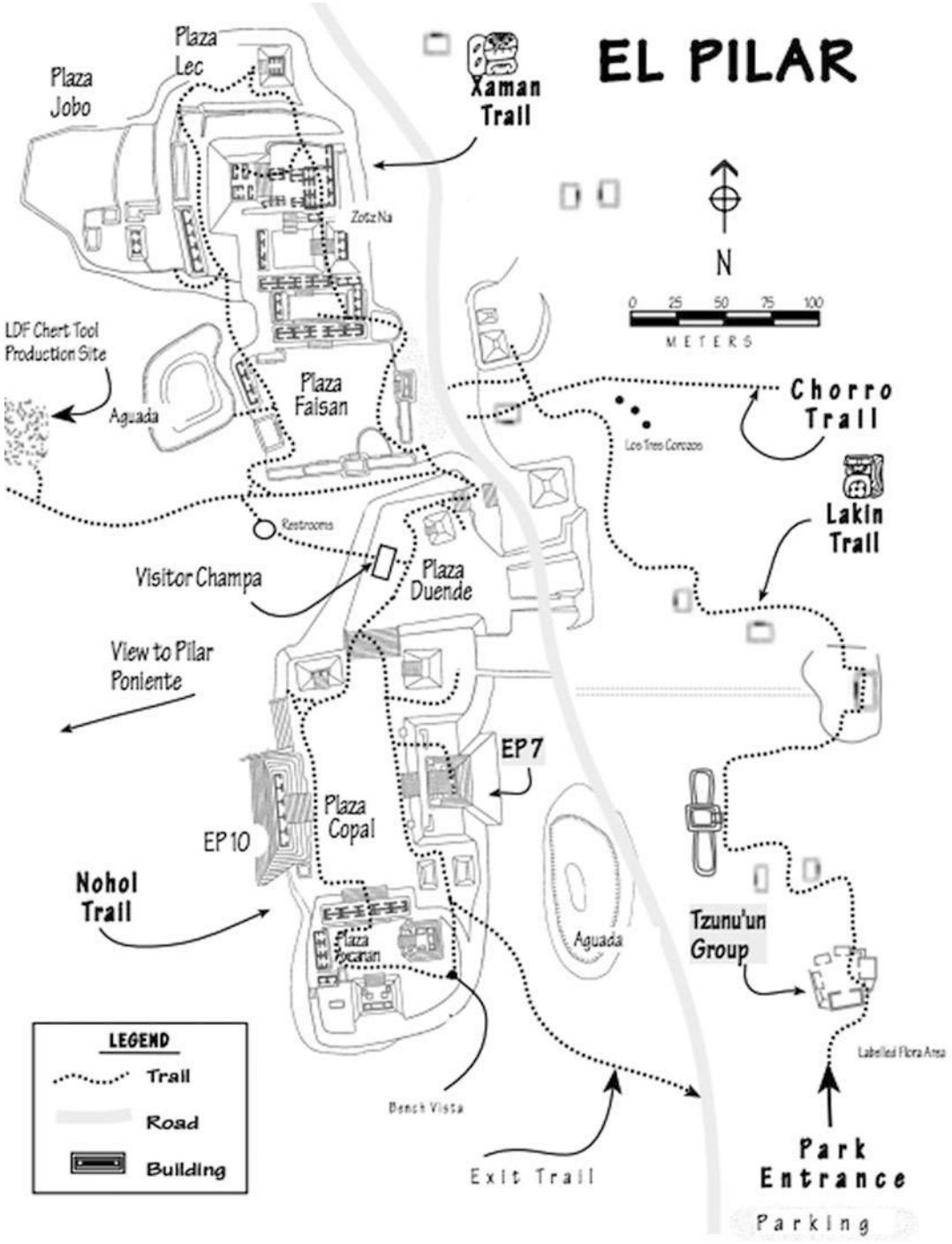
Survey, mapping, and looter's trench investigations in the 1980s was followed by excavations at El Pilar from 1993 to 2005. Excavations in the site core focused on monumental architecture – the plazas, temples, palaces, and causeways – as we worked with the Belize Institute of Archaeology to open the area for visitors (Fig. 4). Surveys to define the civic center dimensions and locate distant monumental groups were incorporated into the research program, with fieldwork concentrated in Belize and more limited investigations in Guatemala. Settlement surveys led to the rediscovery of El Pilar, and the project has continued to investigate surrounding settlements to understand the residential sustaining areas of the city.

Excavations in 1993/94 investigated accessways, stairs, and corners of monumental structures, producing a detailed map of the El Pilar epicenter. Field operations in 1995/96 concentrated on the major public Plaza Copal (see Fig. 4, south), comprising a tunnel through the eastern winged temple (EP7) and excavations into the corners and stairs of major buildings around the plaza. Investigations from 1997 to 1999 included a Maya household group, called Tzunu'un (see Fig. 4, east), to the east of Plaza Copal, as well as the north acropolis Xaman Pilar (see Fig. 4, north); building consolidation followed excavations in both areas. From 2000 to 2004, our attention shifted from architectural monuments to the city residents, and we developed a settlement study and excavated two domestic areas to investigate questions of daily life in the El Pilar site core. Consolidation of the Tzunu'un house provided public access to residential architecture so that the ancient populace that once surrounded and supported the center could be appreciated. Guatemalan archaeologists consolidated the looter's trench and façade of the main eastern temple at Pilar Poniente (Fig. 3, east), bringing western El Pilar into the interpretive realm and expanding the example of archaeology under the canopy.

The governments of both Belize and Guatemala committed to a series of investments, beginning in 1995, which were implemented over the course of a decade. In Belize, this took the form of a Statuary Instrument establishing the El Pilar Archaeological Reserve for Maya Flora and Fauna in 1998, which followed the declaration of the Monumento Cultural El Pilar by the Guatemalan Consejo Nacional de Areas Protegidas (CONAP) in 1997. A sequence of Mesa Redonda El Pilar meetings, inaugurated to build confidence in the international planning process, resulted in the establishment of common management principles. These principles formed the basis of the parallel plans approved by Belize and Guatemala.

By 2005, El Pilar was established as a contiguous park stretching across the Belize/Guatemala border, with similar management plans approved for 808 ha in Belize and 1202 ha in Guatemala, bringing the total protected area to 20 km around the core of El Pilar. The main site, with ranger housing in Belize, boasts about 10 km of interpretive trails with signage, consolidated areas that showcase the magnificent architecture, rest stops and picnic areas, and the three lavatories across the binational space.

Following the management planning process, the project once again shifted to the community and traditional "▶ Maya Forest Garden", who practice a cyclic agricultural system that enriches forest biodiversity with useful plants. This outreach involved identification of and inventorying economic plants in the village communities of Santa Familia and Bullet Tree in Cayo, Belize, and Santa Teresa La Zarca in Melchor, Guatemala. This endeavor resulted in the development of a school garden program. Beginning with a



El Pilar, Fig. 4 Trail guide to the main monuments of El Pilar

group of local farmers and the recognition of the fleeting quality of local landscape knowledge, the Maya forest garden has become institutionalized in Santa Familia Primary School with an active garden named Känan K'aax ("well managed forest" in Mayan). Established in 2009 by the El Pilar Maya Forest Garden Network, a registered Community Based Organization in Belize, the local group began the selective clearing, identification, and planting of important plants for instruction at the primary school. This collective work produced the El Pilar Forest Garden Color Book, which is published by the Belize National Institute of Culture and History and distributed to all Standard 4 students in Belize (Ford 2006, 2012).

Avid work continues with Maya forest gardeners, and they are incorporated into the current thrust of the El Pilar research program, which is focused on the assessment of cultural and natural resources in the El Pilar Archaeological Reserve for Maya Flora and Fauna. The appreciation of natural and cultural resources encompassed in the reserve area is critical to our management plan. With the acquisition of LiDAR data for the 20 km^2 reserve area, we now have a means of assessing the topography and features of the El Pilar city and its immediate surroundings. Survey of the center is in progress and scheduled to be complete by 2020.

The landscape encountered by archaeologists today retains the signatures of Classic Maya land use, ranging from the largest temples to the smallest quarry. These features must be recorded to understand Maya settlement patterns, and we have developed a protocol to validate features identified in LiDAR imagery through targeted archaeological survey. Project members first analyze LiDAR images in a Geographic Information System (GIS) and identify possible features for investigation. We explore the areas around identified targets and accept or reject them as cultural features, using traditional survey and mapping techniques, aided by handheld Global Positioning System (GPS) units, to identify all cultural features. We record the dominant trees of the Maya forest present around each mapped feature as these plant communities bear the signature of their long relationship with the ancient Maya (Campbell et al. 2006; Ross 2011). The final database incorporates field maps of Maya features in an interactive GIS format (Ford 2014, 2016; Ford et al. 2013; Ford and Horn 2017).

The initial El Pilar surveys concentrated around the area of major architectural monuments and have been guided by LiDAR imagery as the survey area expanded. Our earliest surveys proceeded from minimal knowledge of the surrounding area and were essentially designed as a *tabula rasa*, setting out mapped traverses and strategically covering the area based on cardinal directions. With LiDAR imagery, however, we have gained a powerful tool for understanding surface geography and cultural modifications. The images provide *a priori* information on general topography, target features, and anomalies worthy of further investigation. We can compare interpretations of LiDAR imagery to our traditional surveys, validate the presence of potential architectural features, and confirm the absence of other features in different areas of the landscape.

Our recent mapping efforts at El Pilar started in the core of the ancient center, where traditional surveys were previously completed. We have directed attention to areas that were previously surveyed, areas with few LiDAR elements, and areas with significant LiDAR features. In this manner, we have been able to verify the accuracy of traditional survey methods, validate the relationship of elements and features in the LiDAR with those observed in the field, and build a replicable survey protocol to collect, digitize, and compile mapping and GPS data in the GIS.

Our final maps register a range of cultural features, including residential architecture, *chultuns* (storage pits), quarries, reservoirs or aguadas, terraces, rock alignments or berms, historic sites, and other anomalous landscape modifications. Investigation of low-lying areas without major LiDAR features revealed a general concordance between the absence of features and the lack of residential settlement, although evidence of features not recognized in LiDAR images has also been recorded in these areas. Cultural remains in the low-lying areas appear as rock alignments and linear features that may relate to water management or agriculture; they are narrow

in width and do not conform to residential architecture common in the area. Surveys in areas where large features were identified in LiDAR imagery have discovered complex structures, plazas, temples, and palaces. Fieldwork in 2017 also revealed over 100 quarries, presenting a complicated picture of resource extraction and local land-use strategies in the El Pilar settlement zone.

The process of validating features from LiDAR imagery indicates the totality of cultural remains in the area is much more complex than what the sensor detects. These results suggest a measure of caution when moving from LiDAR returns to settlement models, and that archaeological survey remains an indispensable tool for investigating settlement patterns in the tropical forest of the Maya Lowlands. Nevertheless, LiDAR images of topography, watersheds, and large architectural features provide significant targets for mapping and important guides for archaeological survey. Once complete, the map of the entire 20 km^2 area of the El Pilar Archaeological Reserve will be an important foundation for resource management and a fundamental platform for future research.

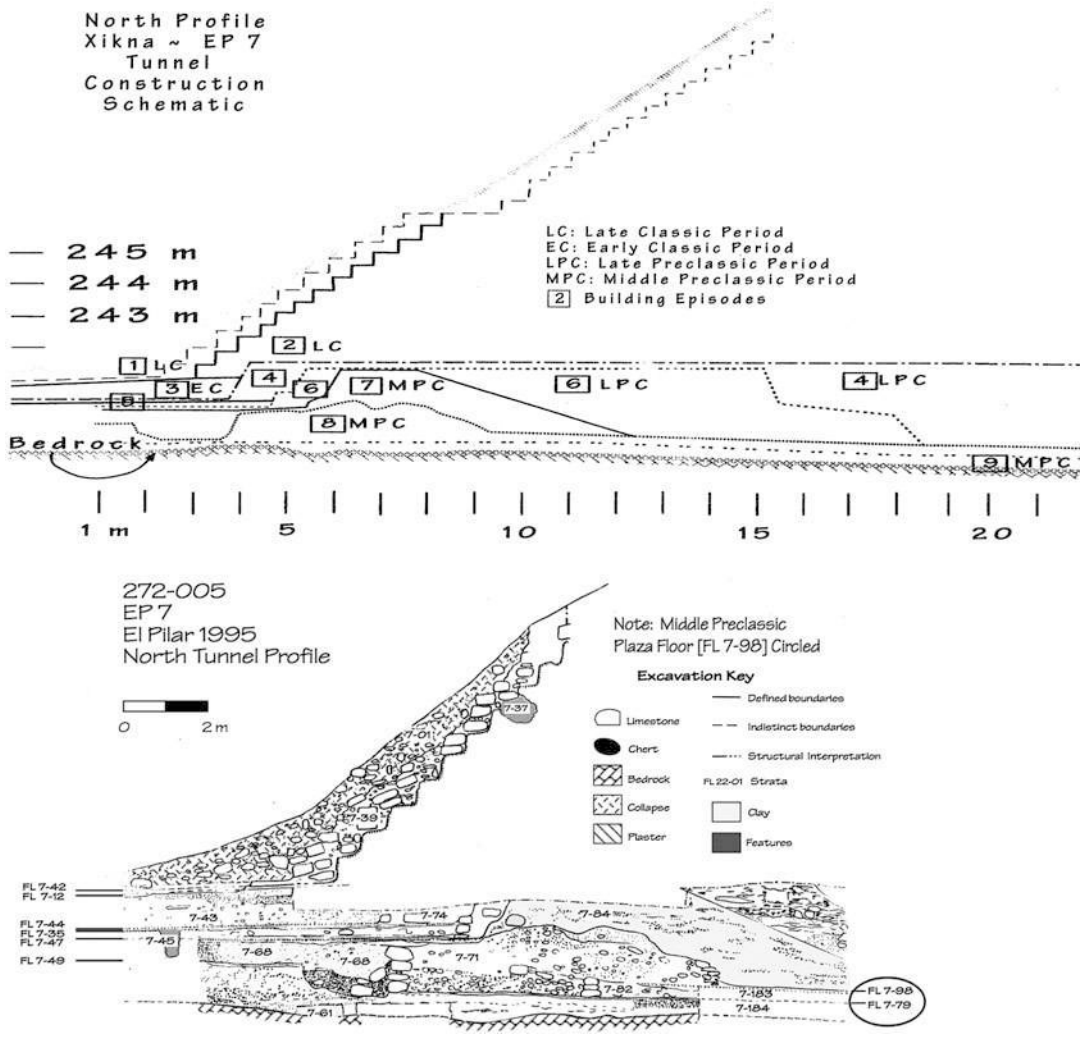
Highlights of Investigations at the Major Maya City of El Pilar

Nohol Pilar, focused around the massive Plaza Copal in the south, was clearly a significant civic area in the ancient city center (Fig. 4). Excavations concentrated on the eastern temple EP7, called XikNa for the platform wings that flank the central temple. A center-line tunnel and deep pit were the main efforts of this investigation. Other excavations included tests units placed across the plaza, excavations into the corners of the two temples that frame the northern entrance to Plaza Copal, and exposure of the stairs of the western temple (EP10; see Fig. 3), called Nohoch Aak for its massive size.

These excavations revealed the deep history of occupation and construction at El Pilar (Wernecke 2005; Egerer 2008). Surface and collapse deposits yielded diagnostic ceramics indicative of vibrant Terminal Classic activities. The EP7 tunnel, which probed the center of the eastern temple for 35 m, revealed a complex construction history spanning the entire sequence of occupation from the Middle Preclassic to the Terminal Classic (Fig. 5, Table 1). Construction began with two successive plaza floors and a low, stone-faced platform built during Middle Preclassic times. These early structures were covered by a massive clay platform later in the Middle Preclassic, which was made from distinctive black clay unlike other early building materials (Ford and Horn 2017). This large platform provides clear evidence of community monument construction dating to the founding of El Pilar as a civic center, and its location beneath a Classic-period E-Group further suggests its early ceremonial significance. The relatively narrow window provided by the tunnel leaves many questions about the interpretation of this early structure, and the possibility that it functioned as part of an early E-Group assemblage remains open. Middle Preclassic architecture was also discovered below EP9 on the north side of the plaza in the form of a small, rounded platform covered with a thick coat of plaster. Late Preclassic through Terminal Classic occupation was evident in all excavations around Plaza Copal and Plaza Axcanan, the latter located further to the south within the site core. Architectural features beneath Plaza Copal indicate a considerable time depth of construction spanning at least 1800 years.

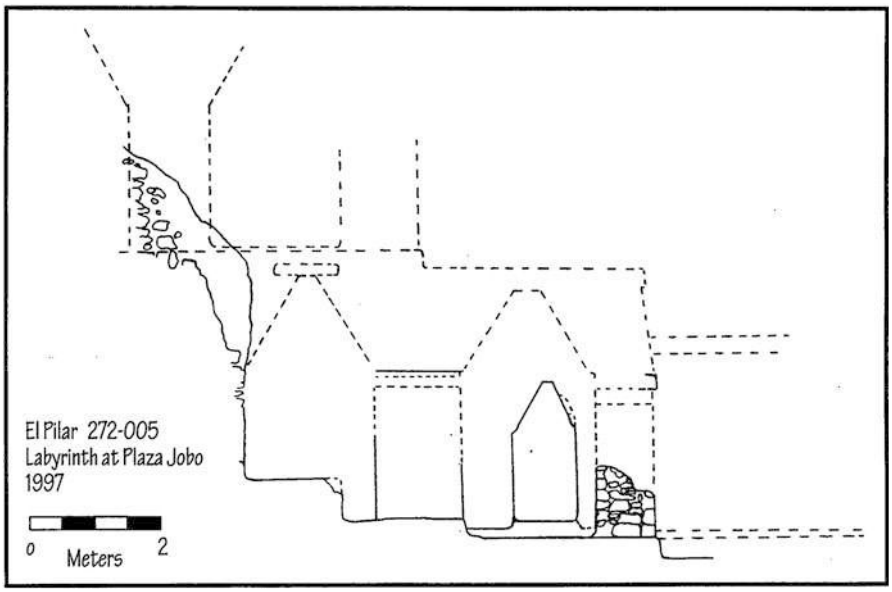
Research in northern El Pilar (Xaman Pilar), clearly the seat of power within the city center, included excavations in most plazas. This work documents a long architectural sequence beginning by the Late Preclassic at the latest and ending in the Terminal Classic/Postclassic. The size of the Xaman acropolis area precluded probes into the earliest constructions. Investigations concentrated in the Zotz Na corridor, the Jobo patio complex (Fig. 6), and the façade and roof of EP25 on the east side of the northernmost Plaza Lec. This fieldwork allowed us to consolidate the three main target areas, to control the escalation of damage, and to promote the visual experience of Archaeology Under the Canopy for visitors.

Archaeological investigations were also conducted outside the major Classic-period monuments of El Pilar. We excavated three exemplary domestic areas to compare aspects of everyday life among different groups of El Pilar residents:

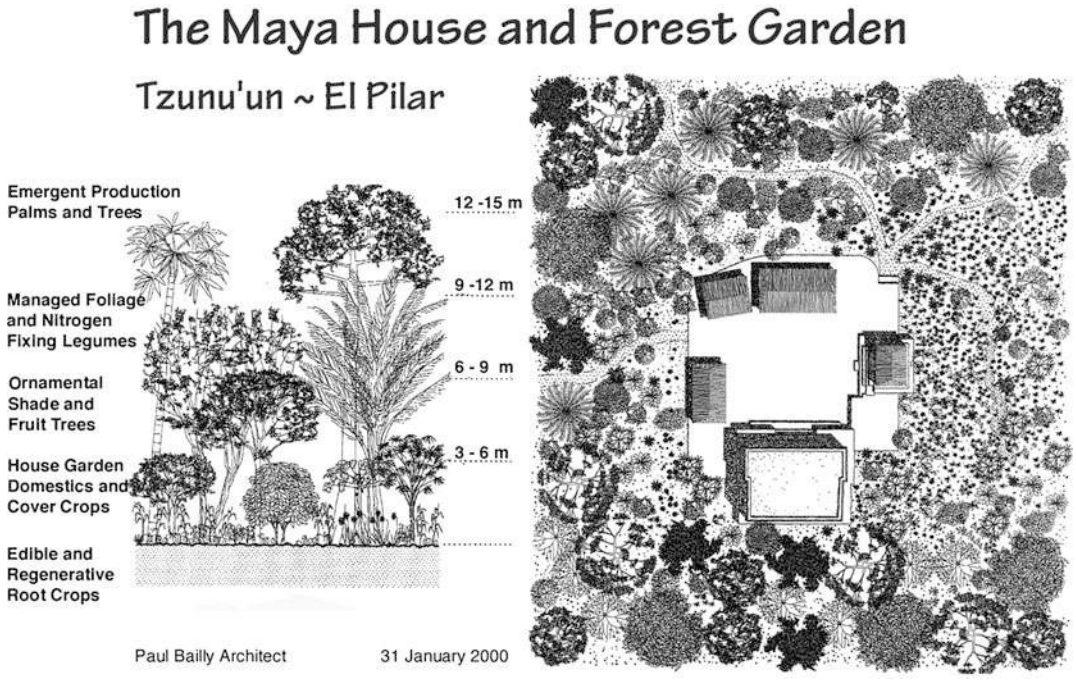


El Pilar, Fig. 5 The long construction chronology begins with the Middle Preclassic and ends in the Terminal Classic as shown form the XikNa profile of EP7

(1) the elite Maya house and forest garden 272-025 (Tzunu'un); (2) a small domestic structure, 272-032 to compare with the larger Tzunu'un residence; and (3) the LDF Chert site, comprising a chert tool working platform and adjacent 50 m^2 debitage dump (Fig. 4 east). The elite household group, Tzunu'un, was mapped, excavated, and consolidated as the first ancient Maya residence open to visitors (Fig. 7). The chronology of Tzunu'un spans the Late Preclassic to the Terminal Classic, with construction concentrated in the Late Classic, the time of greatest activity at El Pilar. Tzunu'un has a high density and variety of domestic artifacts, as might be expected at a wealthy or elite household. Occupation at the small domestic site dated to the Late Classic, and this residence appears to be a secondary domestic site with a low density and variety of artifacts. The LDF Chert tool production site is characterized by an extremely high density of chert debitage, the byproducts of bifacial tool production dating to the Late Classic. This site contained a platform that was the focus of tool production and excavations in an adjacent 50-by-50-m area revealed a massive dump of manufacturing debris. Chipped stone debitage



El Pilar, Fig. 6 Cross-section of Plaza Jobo at the top of the H'Mena acropolis is a labyrinth



El Pilar, Fig. 7 The Elite house of Tzunu'un now open for visitors

was deposited to a height of 2 m in this midden, and an average density of 800,000 flakes/m^3 was recorded by the excavators (Whittaker et al. 2009). This concentrated stone tool production debris suggests some formalized waste-management procedures were developed, either

by the producers themselves or the administrators of El Pilar, to minimize contact with hazardous debris in the form of sharp-edged chert flakes.

In addition to investigating domestic architecture within the El Pilar site core, the discovery of the Citadel (Fig. 3, east) in LiDAR imagery required detailed structure mapping and profiling of two looters trenches dug into the main temples atop the complex. The illicit excavations damaged the temples but allowed us to examine their construction histories. Building sequences were dynamic and extensive, but construction efforts were largely restricted to Late Presclassic times. This complex was established early in the history of the El Pilar site center, yet unlike the rest of the El Pilar monuments and, in fact, most Maya structures, the Citadel temples were completed before the Early Classic and were not covered or expanded by subsequent Classic-period construction. Determination of the reasons behind this curious treatment of monumental structures awaits future investigations.

Pilar Poniente, the western component of El Pilar, is linked with the southeastern Nohol Pilar complex via an offset causeway and sunken plaza containing a ball court. Pilar Poniente is composed of three main plazas and an eastern temple that was heavily looted before the establishment of the reserve. Major rescue work was conducted by Guatemalan archaeologists to stabilize the temple and provide visitors access to the area. The rescue excavations support the long chronological sequence developed for El Pilar, with substantial construction in the Late Preclassic through the Late Classic and a notable presence of constructions during the Terminal Classic period. This parallels the temporal developments in the eastern plaza complexes.

Mapping the Great Maya City of El Pilar

The mapping of El Pilar is a work in progress, designed to create a complete map of the 20 km^2 of the El Pilar Archaeological Reserve for Maya Flora and Fauna in Belize and Guatemala. We covered most of the central area and identified features linked to the causeway system with traditional transect survey methods begun in 2000–2001. Survey baseline transects were established running east to west, and traverses from those baselines identified and mapped ancient remains and tied them into the master El Pilar map. This technique has been employed successfully for regional and local surveys in the Maya lowlands since the work of Bullard (1960).

These maps were integrated into the Maya Atlas (http://marc-ucsb.opendata.arcgis.com/) and, with the acquisition of the LiDAR imagery, we were able to validate the survey and compare mapping strategies. Comparisons between the traditional and LiDAR surveys have been revealing. First and foremost, the traditional surveys were entirely successful in locating and mapping ancient Maya features. Mapped areas of structures, quarries, alignments, and depressions could be identified in LiDAR imagery, relocated, and validated in the field. We noted a displacement of several meters between the traditional surveys and the LiDAR, but this variance did not hinder the relocation of mapped remains and brings up issues of precision and accuracy that are often not well understood (Carr et al. 2015). Standard GPS devices, such as the Garmin 62s used in the El Pilar surveys, report error in the range of a 7-meter radius (Ford et al. 2013). Only field mapping with a Plane Table Alidade, not well-adapted to our technology-driven approaches today, or the use of a survey-grade GPS would bring precision and accuracy to the level revealed in LiDAR imagery.

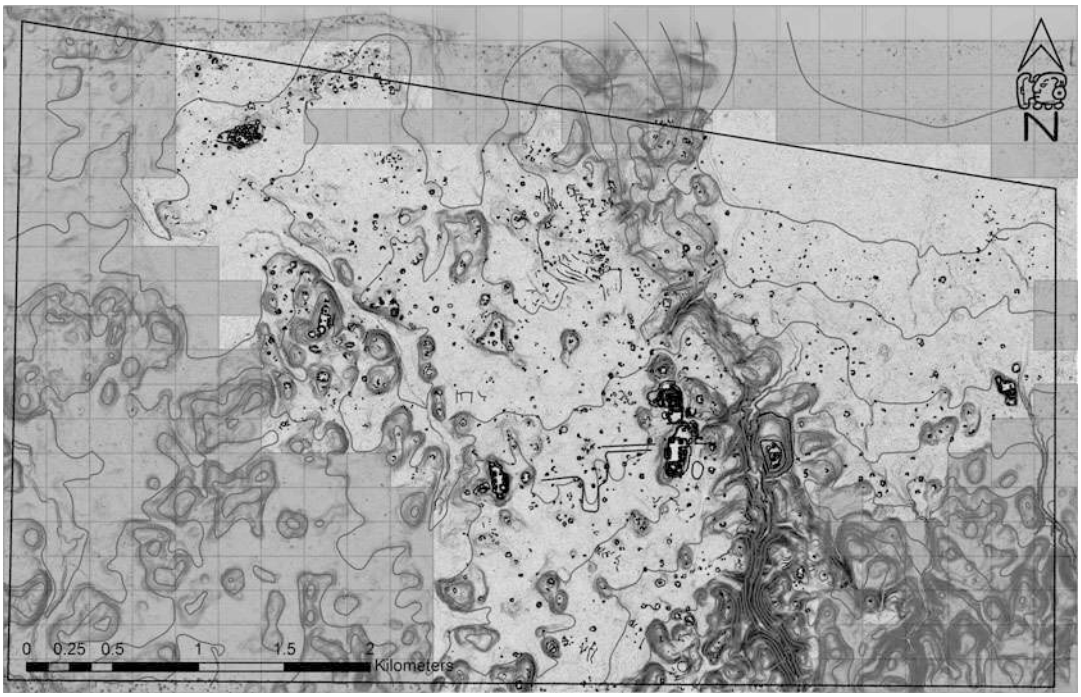
The use of LiDAR, field mapping with GPS units, and the integration of data into a GIS required the development of the mapping protocol described in the preceding sections. This included a system for validating identified features in LiDAR images and the effectiveness of different surface visualizations of LiDAR return data. The El Pilar Archaeological Reserve area was divided into quads of 200 by 250 meters (printable at 1:1500), and we have covered 263 of a total of 445 quads at the close of fieldwork in 2018. In the 13 km^2 of surveyed area, we have documented 821 residential units, 81 underground storage *chultuns*, 255 quarries, 86 aguadas or depressions, as well as 71 berms, linear features that are clustered in the central north of the reserve. We have identified large, monumental complexes in the

LiDAR images and have investigated a substantial fraction of them. Several satellite groups, or minor ceremonial centers, have been mapped and georeferenced in the project GIS, including: the causeways and sunken plaza connecting Pilar Poniente to Nohol Pilar; the Citadel east of the monumental core; the Amatal and Kum groups in the northwest of the reserve, along a small arroyo that runs toward the Holmul drainage; and Chorro in the far east, adjacent to another arroyo running toward the upper reaches of the Belize River.

El Pilar and the Maya Forest

Our research at El Pilar suggests its significance within the ancient Maya social landscape. El Pilar is a major center with more than 30 plazas and monumental structures spread across more than 150 ha within the 20 km^2 reserve (Fig. 8). On the east, the Preclassic Citadel stands alone without a clear connection to the Classic period monumental architecture (see Fig. 3). El Pilar has three major monumental groups of structures and plazas: Nohol in the south, Xaman in the north, and Poniente to the west. Nohol and Xaman are closely integrated (see Fig. 4) and Poniente is linked to them via a complex causeway system. Construction at the monumental core of El Pilar demonstrates a consistent and continual building sequence that began in the Middle Preclassic (c. 800 BCE), blossomed in the Late Preclassic (c. 250 BCE), and was continuously expanded and renovated into the Terminal Classic (after 1000 CE).

The role of El Pilar is clearly that of a local power, occupying an escarpment between the central ridgelands of Tikal to the west and the descending foothills and valley to the east. This location united influence spreading from the interior of the Petén into the Belize River Valley. Large- and medium-size neighboring sites, such as Naranjo and Holmul to the north and west, and Xunantunich, Cahal Pech, and Baking Pot to the south and east all lie with 10–20 km, indicating El Pilar's strategic position in the Late Classic regional settlement hierarchy. El Pilar's setting, atop a ridge at the edge of a limestone escarpment,



El Pilar, Fig. 8 The total area of the El Pilar Archaeological Reserve for Maya Flora and Fauna

geographically dominates the open plains north of the Belize River. This ecotone setting puts El Pilar in a pivotal point of control associated with both the central core area west to Tikal and south/east into the Belize River drainage. As the story of the Central Maya Lowlands unfolds, the critical position of El Pilar and its inhabitants will take on greater importance.

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Electron Spin Resonance (ESR) Dating in Archaeology

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Introduction

Electron spin resonance (ESR) has been used for absolute dating of archaeological materials such as quartz, flints, carbonate crystals, and fossil remains for nearly 50 years. The technique is based on the fact that certain crystal behaves as natural dosimeters. This means that electrons and holes are accumulated over time in the crystal lattice induced by surrounding radiation. The age is obtained by calculating the dose received compared to the dose rate generated by the surrounding environment, mainly radioisotopes K, U, and Th. The dating range is dependent on the nature and state of conservation of the sample and the surrounding environment but is between a few thousands and a couple of million years. Since, ESR dating is best and most commonly applied to tooth enamel in archaeology, this paper predominantly focuses on its direct application to fossil remains.

Definition

ESR Basic Principle

In solid-state physics, trapped electrons and holes can be represented with the band model, where electrons are localized by pair of opposite spins on the bands and define the possible energy level they can reach (Fig. 1). The difference between the valence and the conduction band is the energy needed to break a bond in the crystal.

When a bond is broken, the electron has absorbed enough energy to leave the valence band and to be transferred into the conduction band. Near the valence band remain positively charge holes; most of the time electrons will recombine with the holes, returning the crystal back to an electrically neutral state. Crystals, such as hydroxyapatite, which forms tooth enamel crystal, for example, contain defect sites (vacancies, impurities, interstitial atoms) where electrons and holes can be trapped (e.g., Grün 2006).

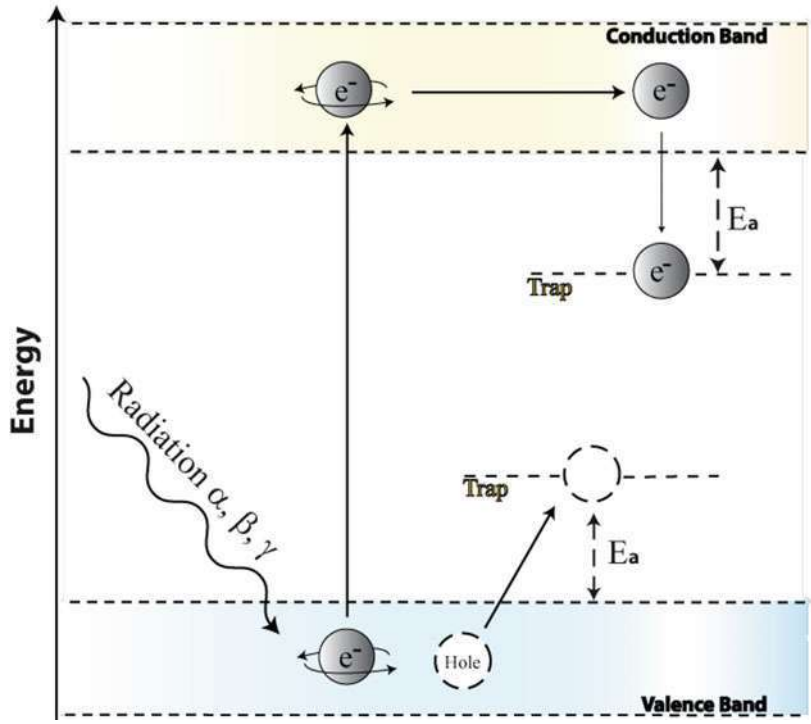
In Fig. 1 we can see that the amount of trapped electrons and holes is linked to the amount of radiation received by the crystal. The activation energy E_a characterizes the traps and its stability and represents the required energy to free the electron from the trap. At the same time, ionizing radiation can split molecular bonds, leading to the formation of free radicals (e.g., CO_2- radical in the hydroxyapatite crystal in tooth enamel, Callens et al. 1987).

The stability (or life expectancy) of traps or radicals is proportional to the value of the activation energy E_a, the thermal stability increases with the E_a. The life expectancy τ_e of an electron trapped or of an unpaired electron associated with an organic radical can be estimated using the Arrhenius equation:

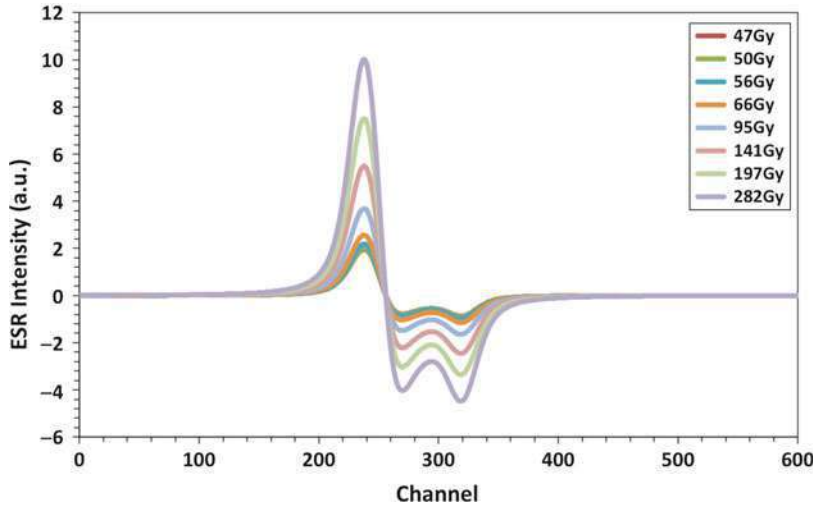
$$\frac{1}{\tau_e} = \nu_0 . e^{\left(\frac{Ea}{KT}\right)} \quad (1)$$

where k is the Boltzmann constant, T the temperature, ν_o the frequency, and E_a the activation energy.

The life expectancy of an electron trapped in a crystal can vary greatly from a few seconds to a few million years, depending on the material, the trap, and environmental conditions. ESR dating consists of measuring the amount of paramagnetic centers created by natural or laboratory irradiation. The intensity measured is proportional to the amount of radioactivity received by the material over time, the amount of traps or radicals available (sensitivity), and the exposition time (age of the material).



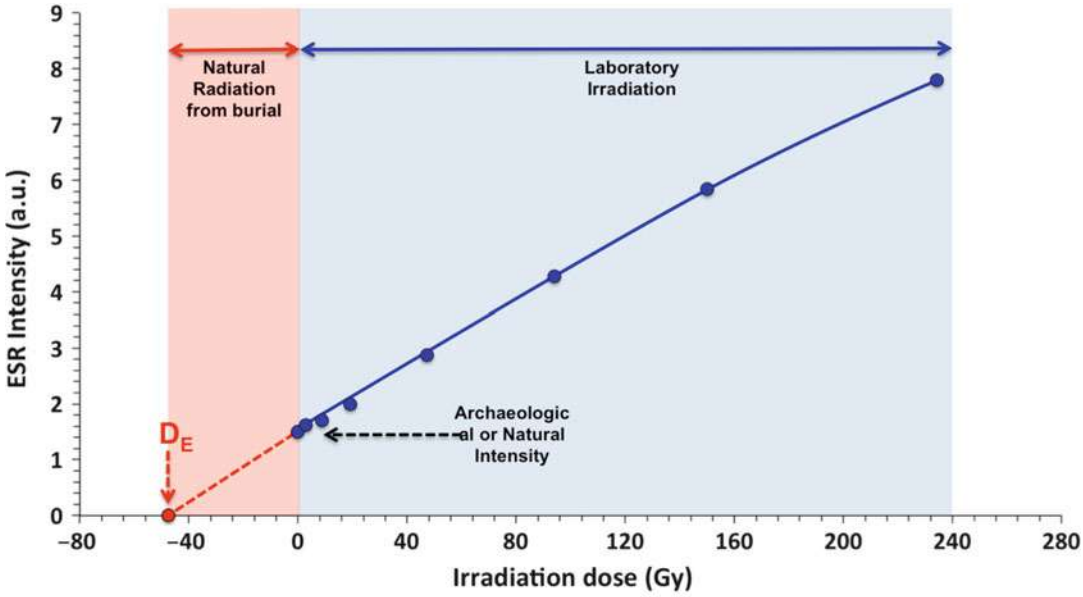
Electron Spin Resonance (ESR) Dating in Archaeology, Fig. 1 Band model of trapping charges processes under radiation. (Adapted from Ikeya 1993)



Electron Spin Resonance (ESR) Dating in Archaeology, Fig. 2 Influence of laboratory γ-irradiation on the ESR signal of fossil tooth enamel. ESR spectra of fossil tooth enamel are increasing with irradiation; however, the signal remains qualitatively the same

Assessing the Dose

ESR dating is only possible when materials behave as a natural dosimeter, meaning that the sample records radiation over time (Fig. 2). The palaeodose corresponds to the dose that the sample has received over time and is directly related to the age. The common method for determining the palaeodose is the additive dose system, where the sample is successively irradiated with incrementing dose and then the intensity measured is plotted versus the irradiation steps (Fig. 3). The dose–response curve, by extrapolation, will indicate the D_E (equivalent dose), which corresponds to the dose the sample has received



Electron Spin Resonance (ESR) Dating in Archaeology, Fig. 3 Determination of the equivalent dose D_E. Dose–response curve of the ESR intensity (au) signal against the dose received. The De is obtained by extrapolation of the curve to cross the x-axis

over time. The dose is described as *equivalent* since it is determined using laboratory gamma irradiation, while the actual dose received in nature is the sum of all radiations from multi-energetic emissions α, β, γ, and cosmic rays.

To obtain a dose–response curve, intensities measured are plotted against a laboratory irradiation dose. The estimated dose–response curve can be best fitted with an exponential curve or single saturating function. The trapping is constrained by the limited number of traps available in the crystal, as well as an ability to trap more electrons, which is inversely proportional to the number of electron already trapped. Exponential fitting is more accurate than a linear fitting; however, it may only be an approximation of the curve that actually occurs. Grün (1989) defined six basic properties that the ESR measurement must satisfy to provide reliable D_E estimation and to avoid large systematic errors: (i) the initial signal (at t_0) is either zero or can be experimentally determined; (ii) the signal intensity grows proportionally to the dose received; (iii) the signals must have a thermal stability, which is at least one order of magnitude higher than the age of the sample; (iv) the number of traps is constant (Recrystallization, crystal growth, or phase transitions must not have occurred.); (v) the signals should not show anomalous fading; and (vi) the signals are not influenced by sample preparation (grinding, exposure to laboratory light, etc.).

The dose that has been absorbed by the sample during the burial time is the D_E and can be written as

$$D_e = \int_{t=0}^{t=T} D(t)dt \qquad (2)$$

where D is the dose rate and T the time of exposure, which correspond to the age of the sample.

The dose rate $D(t)$ corresponds to the amount of radiation received by the sample. If we assume that the dose rate is constant, the age of the sample will be

$$T = \frac{D_E}{D}. \qquad (3)$$

where T is the age of the sample and D is the dose rate.

Internal and External Dose

The external dose is derived from the environment surrounding the sample, including from cosmic rays (Fig. 4). Radioelements taken into account in the calculation of the external dose rate are thorium, uranium, and potassium. Different techniques can be used to identify the concentration of these elements, either by counting the number of particles emitted (e.g., spectrometry α) or by measuring directly the isotopic concentration (e.g., mass spectrometry).

The external dose is expressed by the following equation:

$$d_{(external)} = (kd\alpha_{ext} + d\beta_{ext} + d\gamma_{ext} + d_{\cos})t \quad (4)$$

where $kd\alpha_{ext}$ is the alpha dose rate and k the α-efficiency; $d\beta_{ext}$, beta dose rate; $d\gamma_{ext}$, gamma dose rate; and d_{cos}, the cosmic ray dose rate.

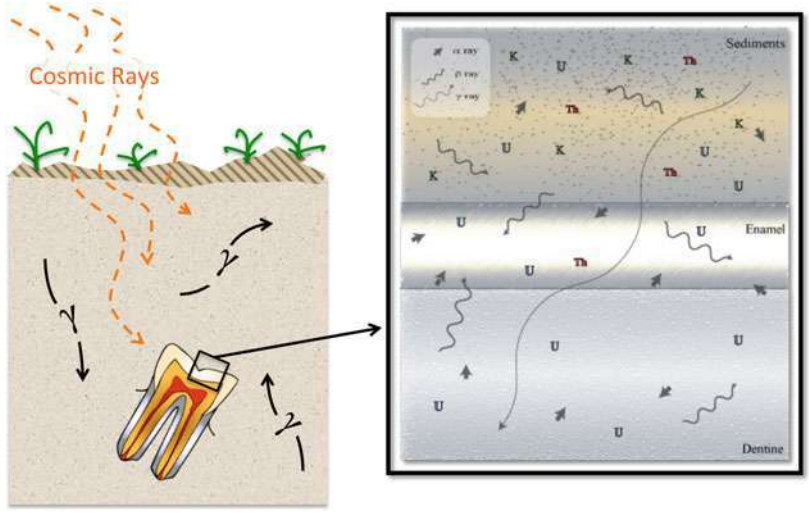
The internal dose is expressed by the following equation:

$$d_{(internal)} = (kd\alpha_{\text{int}} + d\beta_{\text{int}})t \quad (5)$$

where $kd\alpha_{\text{int}}$ is the alpha dose rate and k, the α-efficiency and $d\beta_{ext}$, beta dose rate.

The internal dose rate is calculated from the radioelement emission of α and β particles within the sample (5) (Fig. 4). In the case of fossil remains, tooth enamel is usually free of K and Th; therefore, only U-isotopes have to be considered. The internal dose rate adds further complexity, as the amount of U-isotopes in the tooth may vary through time. Therefore, the uranium uptake history plays an important role in the calculation of the average dose rate. In the past, uranium uptake was often assumed, and conventionally two models were used: the early uptake and the linear uptake. In the first model, uranium was modelled as being incorporated within the tooth after a short time; in the second model, uranium uptake was modelled as being continuously diffused during burial at a linear rate. The differences in these models may cause extremely large uncertainties (Grün et al. 2006).

The alpha efficiency corresponds to the ability of alpha particles to create an ESR signal. Because alpha particles have an important ionization energy, a significant local saturation can be observed, inducing fewer paramagnetic centers to be created. The k factor in front of $d\alpha_{ext}$ in the equation is calculated in order to correct for the attenuation of alpha source within the material.



Electron Spin Resonance (ESR) Dating in Archaeology, Fig. 4 Schematic representation of the surrounding environment of a fossil tooth in an archaeological site. (*Left*) Cosmic ray influences vary depending of the depth of the sample and the nature of the sediment layers. Gamma rays from surrounding elements and sediment layers for up to 30 cm away from the sample can still potentially reach the fossil. (*Right*) Detail of the immediate external dose and the internal dose contribution

The factor varies depending on the material. For example, the alpha efficiency was estimated at 0.13 ± 0.2 in fossil tooth enamel (Grün and Katzenberger-Apel 1994).

The annual dose, which corresponds to the dose that the sample has received over a year, can be written:

$$D_{annual} = d_{(external)} + d_{(\mathrm{internal})} \qquad (6)$$

The external α contribution in the total dose rate is only a few percent and can often be negligible. In contrast to α particles, the influence of β and γ rays in the electron trapping process is significant. The external β dose rate must be calculated from sediments directly surrounding the sample being dated. The external dose is derived from the chemical analysis of U, Th, and K of the sediment. The water surrounding the sample has to also be included in the calculation of the β and γ dose rates. γ rays are usually measured in situ, when possible; otherwise the external γ dose rate is derived from the chemical analysis of sediments. The amount of cosmic rays received by the sample will depend on the altitude, latitude, and the depth of the sample within the sediment, as well as the nature of sediment.

Errors and Uncertainties

The ESR dose estimation error is estimated with the equation described by Yokoyama (Yokoyama et al. 1985).

$$\Delta T = T\sqrt{\left(\frac{\Delta D_E}{D_E}\right)^2 + \left(\frac{\Delta D}{\Delta}\right)^2}. \qquad (7)$$

Random error is considered to be in the range of 5–7%. In ESR dating, systematic errors are usually unknown and therefore cannot be corrected. The systematic calibration errors can be sometimes as high as 5%. The largest error in ESR dating of tooth enamel is usually associated with the unknown U uptake. When using parametric models, such as early or late uptake, errors in the 50% range are often found. A common mistake is the negligence of errors. However, this should be considered as important as the dose calculation itself.

Key Issues/Current Debates/Future Directions/Examples

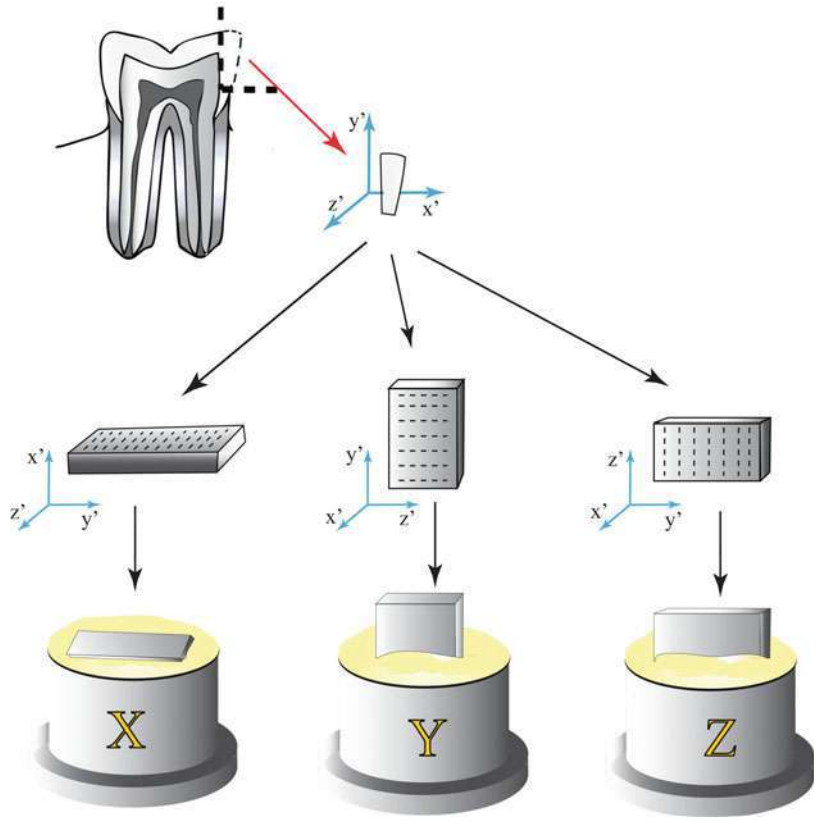
ESR dating is most commonly applied to fossil remains from animal or human. Nevertheless, other materials have been dated by ESR with different level of success.

Carbonate crystal, such as corals, speleothems, calcites, travertine, and mollusc shells, can be dated by ESR; however, the complexity of the signal and doses calculation constrained severely the accuracy. U-series dating and radiocarbon dating are usually the preferred methods, especially for corals and speleothems.

Cherts and quartz are other materials that give a datable signal by ESR. Nonetheless, other techniques such as TL and OSL, respectively, are generally more reliable.

The main advantage of ESR dating remains its ability to date directly the sample, especially fossils. Unfortunately, bones are not suitable for age assessments by ESR dating. This is because complex diagenetic processes occur during burial, leading to the destruction of some bone structures. Only fossil enamel appears to be suitable for direct dating with ESR.

Far too many studies have been carried on tooth enamel to be reported in this entry, but the successful application on archaeological and paleoanthropological sites has been reported for fossils ranging from a few thousands (e.g., Grün et al. 1996) to about a million years (e.g., Han et al. 2012) and exceptionally to a few millions of years (Curnoe et al. 2001). A strong limitation lies in the destructive nature of ESR dating of fossil remains. Commonly, fossil enamel was crushed into powder; nevertheless, recent advance in ESR dating (Joannes-Boyau and Grun 2009, 2011a, b; Joannes-Boyau et al. 2010a, b) allows now the direct nondestructive dating of fossil enamel fragment. The initial step of sample preparation requires a fragment to be removed from the tooth. The use of natural cracks in the enamel offers the best opportunity to separate the fragment, causing minimal damage to the remaining tooth. Small fractures frequently occur on fossil tooth enamel caused by environmental processes during burial. When all experimentation has been completed, the fragment



Electron Spin Resonance (ESR) Dating in Archaeology,
Fig. 5 Measurements configuration for nondestructive analyses of fossil tooth enamel fragments. The holders are inserted in an ESR spectrometer fitted with a goniometer to allow the rotation of the fragment over 360°

can be reattached to the tooth, with little visible damage. As the impact on the fragment itself is minimal, this protocol is considered to be virtually nondestructive. The tooth is then measured in all configurations to simulate powder analyses (Fig. 5). ESR dating of fragment not only permitted a nondestructive approach but also highlighted errors and underestimation of powder dating (Joannes-Boyau and Grün 2011a, b), enhancing the accuracy and precision of direct dating.

Cross-References

- ▶ Dating Methods (Absolute and Relative) in Archaeology of Art
- ▶ Dating Techniques in Archaeological Science

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Elgin, Lord Thomas Bruce

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Basic Biographical Information

The name of Lord Elgin (1766–1841), Scottish peer and British diplomat, 7th Earl of Elgin and 11th Earl of Kincardine, will forever be linked to the classical sculptures he removed from the Parthenon and Acropolis in Athens and to the cultural property controversy that his actions spawned. The fate of the "Elgin Marbles," sold by Elgin to the British Museum in 1816, continues to spark discussion and debate. Those who believe the museum should retain the marbles view Elgin as the man who rescued them from likely vandalism and destruction. Proponents who seek the return of the marbles to Greece regard Elgin as a plunderer (Byron's "worst, dull spoiler") who abused his political authority to mutilate and cart off one of the world's greatest cultural treasures.

In late 1798, after serving in diplomat postings to Vienna, Brussels, and Berlin, Elgin was named Ambassador Extraordinary and Minister Plenipotentiary to the Sublime Porte of the Turkish Sultan at Constantinople. Elgin's appointment to the Ottoman court followed hard upon Napoleon's invasion of Egypt earlier in the year. The new ambassador's mission was to develop an alliance with Turkey in order to expel the French from Egypt, which was nominally under Turkish rule, and to consolidate British interests in the region.

Major Accomplishments

Before setting out for Constantinople, Elgin decided to undertake an ambitious project to draw, record, and model the sculptural and architectural monuments of classical Athens with the goal of improving the arts in Britain. At this stage of the endeavor, there was apparently no intention of collecting original antiquities; Elgin's interest, typical of his era, was to provide exemplars of classical masterworks for imitation by contemporary artists, for which measured drawings, plans, and plaster molds would suffice. Elgin requested, and was refused, a government subvention for his project, but he persevered using his own funds. After setting out in September 1799 to take up his embassy, Elgin assembled his team for Athens, including the artist Giovanni Battista Lusieri, recommended by that famous collector of ancient pottery, Sir William Hamilton, the British minister at Naples; and a group of draftsmen, architects, and modelers, hired in Italy by Elgin's private secretary, William Richard Hamilton (Smith 1916: 164–77; St. Clair 1998: 6–10, 20–7).

Lord Elgin arrived in Constantinople in November 1799. His artistic team did not arrive in Athens until July 1800. There they encountered a series of difficulties that stymied their efforts. Ottoman political authority was divided between the local governor and the military commander, and the Acropolis was a fortress and occupied by the commander, his garrison, and their families. Elgin's men had to pay a fee each time it entered the Acropolis, and access to the upper reaches of the Parthenon was strictly forbidden. It was clear to Philip Hunt, Elgin's staff chaplain and diplomatic agent, who visited Athens in May 1801, that a written authorization (*firman*) from Constantinople

was necessary, and he drafted a memorandum requesting permission not only to draw and model but also to erect scaffolding, dig the foundations, and to take away sculptures or inscriptions that were not part of the fortifications (St. Clair 1998: 65–7, 86–8). Fortunately for Elgin, at this very time British forces in Egypt had thoroughly defeated the French and were on their way to expelling them from the country. Cairo capitulated on 17 June 1801, and Elgin's *firman* was signed on 6 July (Williams 2009: 67). The connection between the two events cannot be doubted, as Elgin himself testified in 1816, "the whole system of Turkish feeling met with a revolution, in the first place, from the invasion by the French, and afterwards by our conquest;" and "about the middle of the summer of 1801 all difficulties were removed" (Michaelis 1871: 348, 350).

The 1801 *firman*, preserved only in an Italian translation, granted the rights requested in Hunt's earlier recommendation, including access to draw and model the remains, to dig the foundations to obtain inscriptions, and to take away "some pieces" of stone with inscriptions and figures. Now began a wholesale campaign of removals. Elgin's men collected inscriptions, cleared foundations, recovered fallen sculptures, and even convinced the Ottoman governor to allow the dismantling of several metopes that were still attached to the Parthenon, which even Hunt acknowledged was an extension of the terms of the *firman*. Lusieri and his workers also removed large, in situ sections of the Parthenon's continuous Ionic frieze. Marble was sawn away from sculpted blocks to lighten their weight for transport or to take away small pieces as exemplars. A Caryatid was removed from the Erechtheion and replaced by a column of bricks (St. Clair 1998: 92–110, 135).

Elgin thoroughly approved of this work and later testified that he was motivated to collect by the rampant destruction of antiquities that was going on all around him: Wanton vandalism by the Turks, destruction of statuary for making lime, and even the random pickings of foreign tourists were all causing a steady attrition of the ancient monuments. Other contemporaries deprecated Elgin's actions, including English visitors such as Edward Dodwell and Edward Daniel Clarke, who witnessed the heavy-handed dismantling of the fabric of the Parthenon in 1801. Byron's invectives in *Childe Harold's Pilgrimage* intensified (and personalized) contemporary criticism of Elgin and continue to provide poetic fodder for his critics (St. Clair 1998: 96, 102–3).

With the bulk of removals completed by the end of 1802, the difficult task of transporting Elgin's marbles back to England began. Between 1800 and 1825, more than two dozen ships, including both privately contracted carriers and British naval vessels, ferried Elgin's collections home. One ship, the *Mentor*, carrying Elgin's agent William Richard Hamilton and ten crates of sculptures and molds from the Parthenon, was wrecked off the island of Kythera in 1802; Hamilton spent months on the scene and was eventually able to recover most of the sunken antiquities (Smith 1916: 197–8, 231–52).

Lord Elgin left Constantinople for home in January 1803 but was imprisoned by the French when war broke out with England while he was in France; he did not return to England until June 1806. He spent much of his time during the next 10 years assembling his collection, making it accessible for viewing, and trying to persuade the British government to purchase it. He first installed the marbles in a house in Park Lane, London, in 1807, later moving them to a shed at Burlington House in 1811. He suffered from the debts he had incurred in Athens, which he estimated in excess of 62,000 £. In 1816 a select committee of the House of Commons considered the question of purchasing the Elgin collection, and after hearing testimony by Elgin and his associates, as well as by artists, sculptors, and connoisseurs, the committee upheld both Elgin's authority to acquire the marbles and their outstanding value as artistic masterpieces. After a lively debate, the House of Commons voted to purchase the collection for the nation for the sum of 35,000 £, far below Elgin's stated expenses, and by a vote of Parliament, the collection, to be known as "The Elgin Collection," was vested in perpetuity to the trustees of the British Museum (Smith 1916: 294–351; St. Clair 1998: 245–60). The collection includes, from the Parthenon, 15 of 92 metopes, 17 pedimental figures, and 247 ft. of the original 524 ft. of the Ionic frieze; from the Erechtheion, a Caryatid, a column, and other

architectural pieces; four slabs of the frieze of the Temple of Athena Nike; and architectural pieces from the same temple and from the Propylaia (British Museum Website n.d.).

Lord Elgin never escaped the pressures of the debts he incurred acquiring his famous collection. He died in France in 1841, leaving a substantial family debt, a remarkable collection of classical Greek art in London, and an ongoing controversy that has become the quintessential cultural property debate: Was Elgin a rescuer or plunderer? Did he overstep his authority? Should the celebrated marbles remain in the British Museum or return to Greece?

Cross-References

- ▶ Classical (Greek) Archaeology
- ▶ Classical Greece, Archaeology of (c. 490–323 BCE)

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Empire in the Ancient Near East, Archaeology of

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Introduction

The ancient Near East was home to the world's earliest empires emanating from the great centers of civilization in Egypt, Mesopotamia, and Anatolia. The earliest empires date to the end of the third millennium BCE when Sargon of Akkad and his dynasty (c. 2350–2193 BCE), and later the kings from the Third Dynasty of Ur (2111–2004 BCE), integrated large parts of Mesopotamia and projected their influence even further. The second millennium BCE saw the rise and fall of a number of smaller empires that were often vying for political, military, and economic advantage. The Late Bronze Age (c. 1550–1200 BCE) in particular saw continuous competition for territory and power between the Hittites, Assyrians, Babylonians, Mitanni, and Egypt. The collapse of the economic and political system at the end of the Late Bronze Age brought a period of economic and political reshuffling that would eventually give way to the classic "world empires" of the first millennium BCE: the Neo-Assyrian (744–612 BCE), Neo-Babylonian (612–539 BCE), and Achaemenid Persian (538–331 BCE) empires. These three empires were highly complex and incorporated vast areas of the modern countries of Iran, Iraq, Turkey, Syria, Lebanon, Israel, Jordan, and at times Egypt. Given the political, military, economic, and cultural power of the empires of the ancient Near East, archaeological investigation has the potential to illuminate human life and society on several levels, from the major monuments and treasures of imperial capitals to life in lands that were incorporated into these empires.

Definition

An empire is a large conquest state that incorporates various geographical regions and sociopolitical groups under its control (Sinopoli 1994: 160, 2001: 444). The Archaeology of Empire is a broad approach to the archaeological record that seeks to understand the processes involved in the creation, consolidation, and decline of empires as well as their impact on the physical and human landscapes of the territories under their control. The large geographical spread of empires means that archaeological study must combine a variety of theoretical perspectives and methodologies and also be in conversation with other relevant disciplines such as history and epigraphy that provide

data not available from archaeology (Sinopoli 1994, 2001). As a subset of the broader investigation of empires, the Archaeology of Empire in the ancient Near East attempts to understand the particular ways that empire left its mark on the lands and peoples of the ancient Near East.

Key Issues/Current Debates/Future Directions/Examples

World Systems

One approach to the Archaeology of Empire adapts the concept of core and periphery from Wallerstein's world-systems theory for use in pre-capitalist societies (Chase-Dunn and Hall 1991; Sinopoli 1994: 161). The concept of core and periphery includes the spatial relationship as well as the differences in political, military, and economic power between the imperial core and lands outside the imperial core designated as peripheries. The domination found in the relationship between core and periphery is what Chase-Dunn and Hall call "core/periphery hierarchy" (Chase-Dunn and Hall 1991: 36). While the domination of an empire over a periphery is often massive, the response of the periphery to imperial forces often affects the strategies the empire chooses in its efforts to dominate. Thus, attention to the relationship between the core and the periphery is crucial for understanding the course of the empire.

The Imperial Core

At the center of ancient Near Eastern empires stood one or more major cities that served as loci of political, economic, military, and ideological power. Land surrounding the cities provided agricultural goods and other resources and sometimes experienced changes that can be traced in the archaeological record (Altaweel 2008). Sites such as Hattusa in central Anatolia; Nimrud, Nineveh, Assur, and Khorsabad in northern Mesopotamia; Babylon and Ur in southern Mesopotamia; and Susa and Persepolis in southern Iran come to mind when speaking of imperial cores. Each new ruler built or rebuilt capital cities including palaces, gardens, temples, massive fortifications, irrigation systems, roads, and in some cases libraries such as the famed library of the Assyrian king Assurbanipal (668–627 BCE) uncovered at Nineveh. Along with military conquests, building projects played a major role in the communication of the king's splendor in his royal annals. Some of the palaces, such as those at Nineveh from Sennacherib (704–681 BCE) and Khorsabad from Sargon II (721–705 BCE), had orthostats carved with military and hunting scenes and inscribed with texts repeating the grandeur of the king (Russell 1991). The palaces established visually the power of the king to the court as well as to visiting foreign dignitaries (Winter 1997). Beyond building projects, the economic reach of these imperial centers can be detected in the nonlocal luxury objects and materials found in them. For example, excavations at the site of Nimrud, an Assyrian city in northern Mesopotamia, uncovered a large collection of engraved ivories (Mallowan 1978). Many of these ivories were imported or brought to Nimrud on other terms. In either case, they illustrate the interest in luxury goods and the access to the nonlocal natural resource (elephant ivory) and artistic skill needed to turn the raw material into a finished product. Excavations at the site of Nimrud have also proved valuable because they have provided a relatively full view of an imperial capital (Oates and Oates 2001). While the elite and public aspects of imperial centers (fortifications, palaces, temples) have been explored reasonably well, the non-elite areas of imperial capitals have not been explored extensively and may in the future reveal more about daily life in these major centers (Matthews 2003: 142).

The Imperial Periphery

The imperial periphery is the area outside the core over which the empire maintains some level of control, typically related to the extraction of wealth. Ancient Near Eastern empires incorporated different lands along a continuum of control from direct rule (provincialization) to little or no rule ([buffer states/zones] Parker 2001: 249–250). The archaeological manifestation of imperial control varies widely depending on where the control falls on this continuum and what the extractive goals were for any particular area. For example, in areas close to the core of the Neo-Assyrian Empire, provinces with provincial capitals were created to administer these

areas effectively. In areas further out, the use of local rulers was common as was the threat or actual application of military force. Destruction layers and sites where the Assyrians had direct control materialize important aspects of imperial practice. Imperial texts recovered in excavations in the periphery also aid in understanding the role of imperial officials and administrative techniques throughout the empire. Monumental inscriptions left by empires in places they have conquered or subjugated, such as Nabonidus' as-Silaʿ rock inscription in southern Jordan (Dalley and Goguel 1997), make imperial ideology and military domination visible to the dominated.

Areas incorporated into an empire may experience a variety of interconnected changes depending on an array of contextual factors. These can include economic, technological, social, political, religious, dietary, and material cultural changes, among others. Some changes may result directly from imperial practices, while others may be the by-products of two-way interactions between local and "global" or imperial traditions (Sinopoli 2001: 445). Tracing and explaining such changes in the imperial periphery is an important emerging area of research. The three most prominent areas of change in the periphery are settlement intensification and complexity, economy, and social and political complexity.

Changes in settlement and subsistence patterns related to the economy are one important type of change that may occur with the onset of imperial control. These may include changes in the location and nature of settlement, type of crops cultivated, land management and reclamation practices, land tenure, intensification and standardization of craft production, storage practices, and specialization (Matthews 2003: 143–145). Parker describes a striking example of such changes along the upper Tigris River in southeastern Turkey. There, in an area under direct Neo-Assyrian control, the settlement system and pottery traditions underwent relatively rapid changes between the ninth and seventh centuries BCE as a result of an Assyrian program of resettlement and development (Parker 2001: 266–270). To some extent, these changes were an extension of similar changes visible around the major cities of the Neo-Assyrian imperial core (Wilkinson et al. 2005; Altaweel 2008). Shifts in settlement patterns are also apparent in areas further from imperial cores. Such is the case for much of the southern Levant where increased settlement intensity and complexity peak under the Neo-Assyrian, Neo-Babylonian, Roman, and Byzantine empires.

Economic changes in peripheral regions can be related to the demand for tribute and other material support by the empire (Sinopoli 2001: 456). They can also be related to the expansion of international trade along old and new trade routes and the development of specific resource areas such as the development of mining. Tribute lists in Neo-Assyrian texts highlight the kinds of materials that were exchanged in the ancient Near East. Prominent are metals (bronze, tin, copper, iron, gold, and silver), dyed wool, camels, horses, and other animals. While archaeological remains rarely uncover large caches of metals or other exotic items, finds of luxury items in tombs and other contexts reveal an expanded economy during periods of imperial power (e.g., Tyson 2014: 58–63).

The kinds of social and economic changes mentioned here are also often associated with increased social ranking, the creation or expansion of a local elite, and the creation of new polities or secondary states (Sinopoli 2001: 454). The appearance of the state of Urartu in the ninth and eighth centuries BCE is explicable as a direct result of pressure from the emerging Neo-Assyrian Empire (Zimansky 1985: 3). The patchwork of small polities covering the Levant during the rule of the Neo-Assyrian Empire fits a similar pattern (Joffe 2002). Damascus, Israel, Judah, Ammon, Moab, Edom, and the cities along the coast of the Eastern Mediterranean all found themselves under military and economic pressure from the Neo-Assyrian Empire. In this situation, the local elites capitalized on their associations with the empire to enhance their local prestige and power. This becomes visible in the material culture through the appearance of imported luxury goods, as well as architecture, iconography, and other items that emulate imperial styles (Matthews 2003: 143–144; Tyson 2014: 217–219). Emulation of imperial styles in order to articulate local power is a common pattern; however, possible instances of emulation should be analyzed with careful attention to their find

spots and place within the broader archaeological assemblage (Cifarelli 2018; Marcus 1996: 49–50). The spread of Mesopotamian-style open-court architecture to many places in the Neo-Assyrian Empire is one example of such dynamics and highlights how local elites sought to enhance their own position by association with international styles.

Beyond the Periphery

Other areas lay beyond the control of empires but were influenced by their development nonetheless because of opportunities for trade. Cyprus (ancient Alashiya) was an important supplier of copper to the ancient Near East in the Bronze Age and benefitted from the markets available for their goods. The Late Bronze Age Uluburun shipwreck off the coast of Turkey demonstrates the quantities of metal and other precious goods that were traded by sea during the Late Bronze Age and highlights the demand for such metals driven by the Hittite and Egyptian empires. In a similar way, demand for spices and aromatics during the Neo-Assyrian and Neo-Babylonian periods spurred the development of trade with the Arabian Peninsula. In these cases, it was not direct or indirect imperial control that spurred developments but the economic demand that provided opportunities for distant lands.

Future Directions

As a multidisciplinary area of research, the Archaeology of Empire in the ancient Near East will benefit as archaeologists and historians increasingly work together to understand the patterns left behind by vast imperial systems. While some of the main sites in the imperial cores and in the imperial periphery shed light on local cultures and histories, efforts at understanding the relationships between them will illuminate more precisely the ways that empires dominated their worlds and how the cultures and societies that they dominated responded. One area of research that has not yet made a significant impact on ancient Near Eastern archaeology or history is that of postcolonial studies. Postcolonial approaches to the archaeological record have been applied in other areas (e.g., Dietler 2010) and will undoubtedly be applied to cases from the ancient Near East as scholars seek to explain the encounter between empires and local cultures.

Cross-References

- ▶ Ideology and Materiality in Archaeological Theory
- ▶ Mediterranean Sea: Maritime Archaeology

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Emporion

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Introduction

An emporion, usually translated into English as commercial settlement, trading post, or port-of-trade, was a location where commercial exchange took place. Archaic and classical sources name 24 Greek emporia and Hellenistic and Roman sources mention over 100 different sites that they call emporia. The sites can be found throughout the Mediterranean basin and the Black Sea region. Ancient sources do not provide a great deal of information on what emporia were and few named emporia have been excavated extensively. Consequently, it has been difficult to define the term "emporion."

Definition

The most comprehensive analysis thus far compares the language ancient sources used to describe emporia with what we know about these settlements from other literary, epigraphic, and archaeological sources (Hansen 2006). This interdisciplinary approach has shown that an emporion was a coastal location where commercial exchange took place in self-governing *poleis* (city-states). When located in the non-Greek world, these self-governing *poleis* were usually dependent on another authority. When located in the Greek peninsula, these *poleis* were autonomous. It is also generally accepted that emporia were multiethnic settlements (Demetriou 2011, 2012).

Key Issues and Current Debates

Emporia have been typically discussed in two different fields. At first, they appeared in discussions on the ancient economy because of their role in long-distance trade. These studies were influenced by the work of Karl Polanyi (1886–1964), who identified ancient Greek emporia with an ideal model of an economic institution called "port-of-trade" (Polanyi 1963). Ports-of-trade were defined as coastal or riverine locations, situated at a neutral checkpoint or interface of two groups with differing economic organizations. This model has been criticized successfully by pointing out that emporia were neither neutral nor marginal and that the trading partners' economic systems were similar (Figueira 1984).

Scholars who study ancient Greek colonization and the establishment of new settlements also discuss emporia. The traditional narrative of Greek colonization opposes an emporion and an *apoikia* (colony). According to these accounts, *apoikiai* were political foundations established as agrarian colonies that slowly acquired a territory in the hinterland, which they exploited for the production of agricultural products. One such example would be the colony of Syracuse, whose foundation is traditionally dated to 734 BCE (Thucydides 6.3). In contrast, emporia were established with a commercial purpose in mind, and neither developed extensive relations with the hinterland nor exercised control over a territory (Gwynn 1918; Lepore 1968; Vallet 1968). In this scheme, emporia were not political entities and were smaller in area than *apoikiai*. The most frequently cited examples of commercial colonies without a hinterland are several foundations attributed to Phokaia (Strabo 4.1.5) along the Gulf of Lion on the coasts of France and Spain, such as Olbia, founded in the fourth century BCE, Agathe (Agde), a sixth-century establishment, and Emporion, also founded in the sixth century BCE (e.g., Vallet 1968). These assumptions about the distinction between emporia and *apoikiai* has further led to discussions about whether specific settlements were political or commercial in nature. For example, what is usually called the first Greek settlement in the western Mediterranean, Pithekoussai has suffered especially from this question (Greco 1994).

Recent work has questioned the validity of the false dichotomy between agrarian colonies with a hinterland and commercial colonies without one. On the one hand, archaeological and cadastral studies on the topography of several emporia, typically considered to have been small in size and to have had no relations with the surrounding territory, such as Agathe, Olbia, and Emporion, have shown that the extent of their hinterland and the degree of interaction between the settlement and the territories surrounding it have been vastly underestimated (see Demetriou 2011 for a discussion and full bibliography). Studies of sites usually called *apoikiai*, such as Megara Hyblaia, on the other hand, suggest that it is likely that agriculture and trade were complementary rather than mutually exclusive (De Angelis 2002).

Questions about the political nature of emporia have also dominated the scholarship because, on the surface, ancient sources seem to make a distinction between communities that were emporia and communities that had an emporion. For example, Athens (e.g., Demosthenes, *Against Apatourios, Against Phormio, Against Lakritos, Against Dionysodoros*), Corinth (Thucydides 1.13), and Byzantion (Theopompos *FGrH* 115 F62) are said to have had an emporion, whereas Borysthenes on the Black Sea (Herodotus 4.17), Emporion in Spain (ps. Skylax 2), and Naukratis in Egypt (Herodotus 2.178-9) are called emporia. Based on this superficial distinction in the ancient sources, scholars have presented various models to describe emporia. Bresson (1993) understood an emporion to be either an administered part of a *polis* where commerce took place – e.g., Piraeus in Athens – or a polity that was dedicated to commercial exchange, such as Naukratis. Wilson (1997) argued that emporia developed over time: in the Archaic period any community involved in commerce was an emporion but did not necessarily have a political character until the Classical period (e.g., Naukratis), and by the Late Classical and Hellenistic periods, an emporion was a geographically distinct community with its own administrators and judicial apparatus, as in the case of Piraeus, the fifth-century BCE emporion of Athens. Based on his examination of settlements on the Black Sea littoral, Petropoulos (2005) instead saw an emporion as an intermediate stage in the development of an *apoikia*, namely, a settlement founded with the ultimate purpose of becoming a proper *polis*. A closer examination of the literary sources cited above, however, shows that ancient authors use the term emporion to describe self-governing *poleis* when these are located in non-Greek lands – e.g., Borysthenes on the Black Sea, Emporion in Spain, and Naukratis in Egypt – whereas they say that *poleis* had an emporion when they were located in the Greek peninsula or Asia Minor, as in the case of Athens, Corinth, Byzantion (Hansen 2006). The ancient sources, therefore, do not make a distinction between two types of emporia. Rather, they

reflect the development of the Greek world: they called emporia newer settlements founded on the Black Sea coast and the western Mediterranean whose most important function was commercial, whereas when referring to the older Greek world of the Aegean circle they called an emporion the space in a *polis* dedicated to commercial exchange (Demetriou 2011).

Emporia had various sophisticated political, administrative, and judicial mechanisms put in place in order to facilitate commerce in emporia (Bresson 2016). Although most of the evidence comes from Piraeus, the emporion of Attica (Wilson 1997; Garland 2001), there also exist epigraphic and literary sources that are informative about other emporia (Vélissaropoulos 1977; Mossé 1983; Bresson 2016). From these sources it emerges, first, that an emporion typically had some degree of autonomy, even when it was dependent on another authority. Second, emporia had their own administrators and other officers who ran commercial operations. For example, both Naukratis (Herodotus 2.178), from the sixth century BCE, and Piraeus, from the fifth century BCE onward (e.g., *IG* II^2 1607, 1609, 1611, 1622, 2336), had *prostatai* (guardians) or *epimeletai* (curators), who were probably in charge of the administration of the emporion. Piraeus, the best-known Greek emporion, had an *agora* (market-place) supervised by five *agoranomoi* (market officials), who regulated commerce (*IG* I^2 896; ps.-Aristotle, *Athenian Constitution* 51.1), as well as several other officers, such as the *metronomoi*, who were in charge of weights and measures (ps.-Aristotle, *Athenian Constitution* 51.2), the *sitophylakes,* who regulated the export and import of grain (ps.-Aristotle, *Athenian Constitution* 51.3), the *dokimastes* (examiner), who tested silver currency (*Agora Inventory* I 7180), the *neoroi* (dockyard officials), who supervised the docks (*IG* I^3 73, *IG* II^2 1, 1607, 1609, 1611, 1622, 1623, 1627, 1628, 1631), supervisors of the harbor (*IG* II^2 1012, 1013, 2336), and the *pentekostologoi*, who were responsible for collecting the 2% tax on all imports (Demosthenes, *Against Midias* 133 and *Against Phormio* 34.6). Third, commercial trials were instituted in emporia to expedite procedures that involved traders.

In the Late Classical and Hellenistic periods, emporia experienced further economic and sociocultural developments. The island of Delos, for example, prospered especially after the Roman Senate granted it a "tax-free" status in 167 BCE and placed it under Athens' control (Polybius 30.20-21; Strabo 10.5.4). Earlier, in 227 BC, King Seleukos II granted a similar tax exemption to all traders based on Rhodes, as did several other rulers and cities (Polybius 5.88.7; 5.89.8; 21.43.17; Diodorus Siculus 16.8). Delos and Rhodes consequently attracted traders from all over the Mediterranean and became cosmopolitan centers of commerce. In the same period, associations of traders appeared in emporia which had political, social, economic, and religious functions. These were usually grouped according to the traders' city-state of origin, centered on the worship of a divinity, and represented their members' interests abroad. Examples of these professional associations are known especially from Delos, Rhodes, and Athens, but are also attested in other emporia (Vélissaropoulos 1977; Kloppenborg and Ascough 2011; Steinhauer 2016). Greek commercial centers declined in the Roman period, after 30 BCE.

Future Directions

With few exceptions, emporia have not attracted as many excavations as other *poleis*. The sites that have been excavated extensively are emporia that are relatively well known in ancient sources, such as Naukratis in Egypt (Möller 2000), Emporion in Iberia (see the Monografies Emporitanes series published by the Museu d'Arqueologia de Catalunya, Empúries), Piraeus in Athens (Garland 2001; Lovén 2011), Corinth (see the Corinth monograph series published by the American School of Classical Studies in Athens), and Delos (see the Exploration Archéologique de Délos series, published by the École Française d'Athènes), among others. Given that the main function of an emporion was to facilitate trade, it is not surprising that what are often detected in the archaeological record of an emporion are: an excellent harbor, a greater variety in the

provenance of pottery, a high volume of transport amphorae, a multiethnic population, and religious sanctuaries. Still, there exists no systematic overview of the archaeology of emporia as a category. Further studies could create a model out of the existing archaeological record based on a variety of criteria: quantity and diversity of imports, evidence of mixed cohabitation, presence and extent of relations with the hinterland, etc. Such an exercise will allow scholars to identify emporia in the archaeological record, especially when no other evidence, written or epigraphic, exists for them. For example, the site of Gravisca in Tarquinia (Italy), with an excellent harbor, a mixed population, and ceramic evidence of a high volume of trade, can safely be called an emporion, even though no ancient source uses that term to describe it (Torelli 1988; Hansen 2006). Since emporia developed in different geographical and historical contexts, a useful comparison will be one that takes into consideration sites located in a single region and the relations among them (one example is Gailledrat 2015), and then extending the study to take into account the whole Mediterranean and Black Sea regions.

Cross-References

- ▶ Classical Greece, Archaeology of (c. 490–323 BCE)
- ▶ Cross-Cultural Interaction in the Greek World: Culture Contact Issues and Theories
- ▶ Early Iron Age Greece (c. 1150–700 BCE)
- ▶ Ethnicity and Identity in the Ancient Mediterranean World
- ▶ Greek Colonialism, Archaeology of
- ▶ Greek Islands (Excluding Crete), Archaeology of
- ▶ Sicily and Magna Graecia, Archaeology of
- ▶ Polis
- ▶ Trade and Transport in the Ancient Mediterranean

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Encyclopedic Museum

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Introduction

The concept of the "encyclopedic" or, as it is sometimes known, "universal" museum has been around for a long time, certainly since the sixteenth and seventeenth centuries, and it provided a reference point for much museum collecting subsequently, especially in the nineteenth century. The concept came to renewed prominence in 2003 with the "Declaration on the Importance and Value of Universal Museums" by the directors of a self-selected group of big European and US museums (The Art Institute of Chicago et al. 2003). This Declaration was fairly explicitly represented by the directors as the views of the "international museum community." Actually, this is far from the truth, and there has been intense debate about the concept and the Declaration ever since.

Key Issues/Current Debates/Future Directions/Examples

The Declaration, actually, did not use the term "universal museum," except in its title. Instead, the terms "major museums" and "museums whose collections are diverse and multifaceted" were used. Nonetheless, it is clear that the intention of the 18 signatories was to define such museums (especially, though presumably not exclusively, those run by themselves) as "universal museums." The term "universal museum" appears to have been abandoned somewhat later, after a number of attacks were made upon the concept, and today the museums that were signatories of the Declaration seem to prefer the term "encyclopedic museum."

It is worth noting that the Western world actually has very many "encyclopedic" museums, far more than the 18 which signed the Declaration, even if few are comparable in scale and quality to the 18 Declaration signatories. Virtually every sizable municipal museum service in the UK, for example, is encyclopedic in scope. These museums usually have their origins in the nineteenth century, and at that time, they collected everything they found of interest. What they found of interest was virtually anything antique, British or foreign, as well as art, science, material from "exotic" cultures, and the natural world. As it happened, this period of collecting coincided with the great age of the British Empire, so the opportunities for British museums to amass material culture from around the world were plentiful. Other European museums had similar opportunities.

Somewhat later, American economic power meant that many American museums were able to build collections to match those of the great European museums, sourced from different countries around the world: a form of commercial imperialism rather than military, but collecting based on an imbalance of power all the same. The trouble is these imbalances may be long term, but they are always temporary. The time comes, inevitably, that redress is sought for what can be seen as the plundering by a strong nation of a weaker nation's culture.

Encyclopedic museums therefore contain a wide variety of material; as Cuno puts it, "they comprise collections meant to represent the world's diversity" (Cuno 2008: 140). He goes so far as to differentiate between encyclopedic museums and national museums, which, he says, are merely "of local interest. They direct attention to a local culture," whereas encyclopedic museums "direct attention to distant cultures,

asking visitors to respect the values of others and seek connections between cultures." The argument, as promulgated by all supporters of the encyclopedic concept, is that only by assembling encyclopedic collections in one place (the encyclopedic museum) can their full importance be revealed, through their allowing comparisons to made, and global contexts to be explained.

The Declaration on the Importance and Value of Universal Museums arose out of a meeting of the "Bizot Group" of museums in October 2002, which had been convened to discuss the growing "problem" of requests for the "repatriation" of items being made to some European and American museums. While many claims for repatriation come from outside the Western world, often from parts of the world that were exploited by European imperial powers, the meeting and subsequent Declaration seem to have been preoccupied with the movement to repatriate or reunite the Parthenon (or "Elgin") marbles in Athens. This is demonstrated by the use of the example within the Declaration of "the sculpture of classical Greece" as to why the artifacts of "ancient civilizations" should be "widely available to an international public in major museums."

The Declaration therefore demonstrates a close link between the encyclopedic museum notion and resistance on the part of some Western museums to repatriation claims. It might be suggested that the Declaration was in reality little more than a fairly crude attempt to justify the refusal by some big European and American museums to repatriate items acquired through imperialistic and colonial or other questionable means.

What arguments have been deployed by the self-styled universal or encyclopedic museums to justify their resistance to repatriation?

Many arguments have their origin in the eighteenth-century Enlightenment era thinking about the necessity of an encyclopedic approach to understanding – and in the case of museums, representation – of the world. Importantly for these arguments, the notion of encyclopedic museums predates the growth of nationalistic thought in the nineteenth century, and some of these museums predate the modern nation-states that find themselves in the position of making repatriation claims, either on their own behalf or on behalf of indigenous groups within their nations. The global dimension of encyclopedic museums is crucial; nationalistic perspectives, the kind that gives rise to modern requests for the repatriation of museum collections, are narrow and proprietorial. Indeed, there is more than a whiff of contempt towards claims made by modern governments – Egyptian, Greek, and whoever – because, the argument goes, they are motivated merely by political perspectives, which are transcended by scholastic or archaeological perspectives. Moreover, the nations of these modern governments did not exist when the collections in question were taken into Western encyclopedic museums – so how can the collections possibly belong to these nations? National claims on antiquities "serve the purpose of the modern, claiming nation," as though the purpose of a modern nation, as expressed through its government, is of little consequence (Cuno 2008: 11).

There are a number of justifications for the encyclopedic museum:

- Museums provide a "valid and valuable context for objects that were long ago displaced from their original source" (The Art Institute of Chicago et al. 2003).
- The presence of objects from a civilization, such as the sculpture of classical Greece (in a universal museum), marks its "significance. . . for mankind as a whole and its enduring value for the contemporary world" (The Art Institute of Chicago et al. 2003).
- The aesthetic of works, such as the sculpture of classical Greece, "appears all the more strongly as the result of their being seen and studied in direct proximity to products of other great civilizations" (The Art Institute of Chicago et al. 2003).
- ". . .museums serve not just the citizens of one nation but the people of every nation. Museums are agents in the development of culture, whose mission is to foster knowledge

by a continuous process of reinterpretation. Each object contributes to that process. To narrow the focus of museums whose collections are diverse and multifaceted would therefore be a disservice to all visitors" (The Art Institute of Chicago et al. 2003).

- Universal museums play a role in "cultivating a better comprehension of different civilisations and in promoting respect among them" (Schuster 2004).
- Universal museums allow cultures to be compared. They "offer us the chance to forge the arguments that can hope to defeat the simplifying brutalities of politics all round the world." They have a "worldwide civic purpose" and show the world that "it is one" (McGregor 2004). They can promote tolerance.
- Encyclopedic museums offer access for all, in big centers of population, whereas if collections were to be repatriated to source nations, fewer people would be able to "access" them.

According to these arguments, the importance of visitors being able to compare and contrast cultural items in encyclopedic museums outweighs all other considerations.

Then there are the legal justifications: what was once acquired by a museum legally cannot now be challenged legally. So, Cuno argues that because permission to remove sculptures from the Parthenon in Athens was granted to the Earl of Elgin by the (then) governing Ottoman authorities, "no legal case can be made against Britain's ownership of the (Parthenon) marbles" by the modern government of Greece or, indeed, by anyone else (Cuno 2008: ix).

The conclusion we can draw from these arguments is that proponents of encyclopedic museums reject any notion that their collections should be subject to any reassessment in the light of modern political perspectives. What these museums have, they will continue to hold, and they will resist any claims for repatriation. These museums carry their own authority, and they refuse to recognize the legitimacy of any attempts to challenge this authority, no matter who makes them.

Among the arguments that have been deployed against the view that encyclopedic museums should be allowed to keep all their collections regardless of repatriation claims are these:

- Ideas originating in the Enlightenment cannot be reconciled with scholarship in the fields of postmodernism and postcolonial theory and are too inflexible to accommodate claims on modern museums by modern, diverse communities, socially inclusive practices, and democratic impulses (Flynn 2003).
- Items are ripped from their context, and some should be returned to that context, depending upon the resulting cultural benefits (which include an increase in knowledge and understanding).
- This approach is culturally insensitive, selfish, and arrogant.
- There is no evidence that the encyclopedic museums actually do attempt to show the world that it is one that they engage with contemporary politics or generate tolerance and understanding (O'Neill 2007).
- Encyclopedic museums tend to emphasize the distinctiveness and separateness of cultures rather than the universal. They minimize the impact of interactions between peoples and change. They have usually communicated messages of imperial, white, male, and national superiority, in a world ruled (appropriately) by the West (O'Neill 2007).
- Encyclopedic museums tend to be detached, academic, decontextualized, and hierarchical, privileging a Western aesthetic. They have fed the rationale for colonial domination (O'Neill 2007).
- Museums in Africa and other parts of the world from which material culture was removed by Western nations when they were in a position, militarily or economically, to do so, should be able to represent their own culture, and they do not require the job to be done on their behalf by encyclopedic museums in Western countries. Indeed, many people in source nations are grossly offended by how the culture of their nation is represented in encyclopedic museums.

- It is nonsense to claim that collections are more accessible in big European or American cities than elsewhere – they may be more accessible to some, but obviously not to others.

It has to be remembered that all museums remove items from their context (except in a few cases when an item has been specially commissioned for the museum context), so arguments that universal museums are guilty of removing items from their context are by themselves unconvincing. The issue, surely, is what should happen when the possession of an item is *contested*. Dispute might arise for any number of reasons: because the item was stolen from its rightful owner, because it was trafficked illicitly, and because it is important in terms of identity, national, or otherwise.

As far as encyclopedic museums are concerned, though, all arguments in favor of repatriation are subservient to the argument that encyclopedic museums enable the comparison of cultures from around the world.

Cross-References

- ▶ Authenticity and the Manufacture of Heritage
- ▶ Colonial Expansion and Nation-State Building: Influences on Archaeology
- ▶ Ethnic Identity and Archaeology
- ▶ Museums and the Distortion of Archaeology for Political Purposes
- ▶ Nationalism and Archaeology

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Engaged Archaeology

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Introduction

In 2007 Paul Mullins made the following observation:

> The distinction between serving the interests of the state and conducting an engaged archaeology is more complicated than it might initially appear, but archaeology can emphasize that poverty and racist stereotypes simply rationalize continuing government, institutional and ideological interests. The question for many archaeologists examining inequality is not really how we can make constituent communities civically engaged; instead, the issue is how we can work alongside existing community politics and address long-standing social justice issues like color-line inequalities. (Mullins 2007: 105)

This passage is from *Archaeology as a Tool of Civic Engagement*, one of the first studies to undertake a detailed analysis of how to use archaeology to address issues of social justice and civic responsibility. This book was part of a general trend toward greater political engagement in archaeology. In 2010, Setha Low and Sally Merry investigated the notion of engaged anthropology as the subject of a special issue of *Current Anthropology*. They argued that:

> A diversity of engaged anthropologies emerged from this ferment. Some are forms of support, teaching, and communication; others are social critique – the scholarly pursuit of uncovering the bases of injustice and inequality; and some concern the collaborative approach to research by working with research subjects through collaborative and equal relationships. Some are more radical forms of engagement centered on advocacy and activism.

> These divisions and categories are not rigid or static, but we use them to provide a sense of the diversity of engagements practiced in the United States today. (Low and Merry 2010: S207)

In this entry we discuss the subsequent emergence of, and trends in, an engaged archaeology in terms of the forms of engagement Low and Merry (2010) identified in anthropology: (1) sharing and support, (2) teaching and public education, (3) social critique, (4) collaboration, (5) advocacy, and (6) activism. In doing so, we are able to identify current trends in engaged archaeology.

Definition

Archaeology has a direct impact on groups ranging from farmers and developers to local historical societies and Indigenous peoples. In recent years, archaeology has increasingly intersected with matters relating to social justice and human rights, such as decolonization, ethics, structural violence, cultural and intellectual property, and repatriation. This shift intersects with a concern with ethical globalization, in which human rights are applied in fields beyond their more traditional political and legal realms. As part of this process, non-archaeologists are shaping archaeological practice according to their own priorities and agendas. This change can be encompassed in the term "engaged archaeology."

Engaged archaeology is "shaped by the social and political concerns of the people with whom archaeologists intersect" (Smith 2015). While it is closely aligned to activist archaeology, the principal difference between the two lies with their aims. Activist archaeology is the use of archaeology to support direct action in support of, or in opposition to, a cause or issue (Zimmerman 2014: 19). Engaged archaeology, however, may or may not be informed by any particular cause. Its overriding characteristic is that it is shaped by the communities with whom archaeologists work. Engaged archaeology has three overarching characteristics:

1. It actively engages with the social, cultural, and political dimensions of the lives of the people with whom archaeologists work.
2. It is shaped by the community's wishes.
3. It aims to make a practical difference to people's lives.

Engaged archaeology is a practice that encompasses many kinds of archaeologies. It is most evident in those parts of the discipline that clearly intersect with the contemporary world, such as community archaeology, activist archaeology, archaeologies of internment, cultural heritage management, ethnoarchaeology, and Indigenous archaeology (Fig. 1). Against a background of archaeology that is directed and informed by the community, the methods and practice of engaged archaeology differ according to the particular situation. In addition to variation according to archaeological sub-discipline, they also differ according to country, community, and other social groupings.

The critical difference between engaged archaeology and other forms of archaeology concerns the changing role of archaeologists. Archaeologists who take an engaged approach are likely to concentrate on long-term relationships with specific communities and to develop deeper knowledge of fewer places. The test of whether archaeological practice is truly engaged is the degree to which the research or project is initiated and shaped by community people to address their non-archaeological concerns.

Engaged Archaeology, Fig. 1 Model of engaged archaeology

Historical Background

Within archaeology, an engaged approach has arisen from the confluence of several movements, particularly post-processualism, gender archaeology, Indigenous empowerment, and globalization. The theoretical and methodological shifts inherent in an engaged archaeology encompass both processual and post-processual archaeology and intersect with a growing concern with ethical globalization. Within this development archaeologists have moved beyond recognition of the social and political contexts of archaeological interpretations to shaping archaeological practice according to the values, visions, and agendas of stakeholder groups, such as descendent and Indigenous communities, and to actively engaging with other groups such as journalists, politicians, and multinational corporations (see Endere et al. 2018; Mizoguchi and Smith 2019; Nicholas 2016).

Engaged archaeology is a natural progression from the intersection of public archaeology, gender archaeology, community archaeology, and activist archaeology. The emergence of socio-politics in archaeology during the 1980s and 1990s (e.g., Gathercole and Lowenthal 1990) critiqued the notion that archaeological research is of inherent benefit to humanity, setting the scene for a more politically engaged public archaeology. At the same time, archaeologists working with Indigenous people began to support the reburial of Indigenous human remains and, through that, the rights of Indigenous people to control their cultural heritage in the present. Taken together, these diverse threads engendered a "turn" in archaeology toward an engagement with the present and consideration of the role of archaeology as a tool of civic engagement (see Little and Shackel 2007). In the 1990s and early 2000s, this trend was reinforced by the emergence of community archaeology, which developed new partnerships between archaeologists and communities (see Marshall 2002), and activist archaeology, in which the tools of archaeology are used to support or oppose an issue in an effort to promote change (e.g., Zimmerman 2014; Atalay et al. 2014).

Key Issues and Current Debates

In this section we analyze key issues and current debates in engaged archaeology in terms of the forms of anthropological engagement identified by Low and Merry (2010). These are (1) sharing and support, (2) teaching and public education, (3) social critique, (4) collaboration, (5) advocacy, and (6) activism. It is possible to identify these trends in archaeological practice.

Sharing and Support

The first form of engaged anthropology that Low and Merry (2010) highlight is sharing and support. They note that "anthropological field research typically includes everyday practices of sharing, support, and personal interaction. Such relationships, which include friendship and even forms of kinship, can be thought of as a form of engagement" (2010: S207).

Archaeologists have been practicing this aspect of engagement for a number of decades, particularly in settler/colonial nations. Like anthropologists, archaeologists who work with Indigenous communities can be incorporated into kinship systems, as part of a deepening of relationships and recognition of shared responsibilities and mutual support. In addition, the idea of sharing and support is enmeshed in the practice of community archaeology, which is a disciplinary norm in some parts of the world, such as in the United Kingdom, where archaeologists work closely with historical societies. In other parts of the world, this remains either a developing practice or a future aspiration. Ichikawa (2018) highlights the work he has been doing to develop community archaeology in El Salvador, particularly around the reciprocal nature of archaeological work. He writes that while community archaeology has developed in other parts of the world, it still needs to be further developed in Central America. His recent work in El Salvador (Ichikawa 2018: 223) has focused on two issues:

1. How archaeological findings and collaborative archaeological practices impacted the community residents living at the site
2. How the community's collaboration impacted the archaeologist's work

In observing this process as an outsider, Ichikawa (2018: 232) writes that this engagement strengthens the social relationships of participants, both community members and

archaeologists, arguing that "archaeology changes the attitudes of different actors." In this case, archaeologists tended to disregard the community as unimportant, and in this process, the community was excluded from encounters with their own cultural heritage. In recent years, community members have been allowed to volunteer on excavations, whereby the sharing and support have led to "creating collective memory and cultural identities, reinforcing social relationships between participants who have different interests, and transforming archaeological practice or archaeology itself" (Ichikawa 2018: 234).

In a more general sense, closer relationships between archaeologists and communities morphed into ethical responsibilities toward the end of the twentieth century and further developed not only into standard practice but a benchmark aspiration in more recent years.

Teaching and Public Education

The second form of engaged anthropology described by Low and Merry (2010) is teaching and public education. They write that "instruction in classrooms, in training programs in the context of practicing anthropology, and in individual advising and mentoring constitute another form of engagement" (Low and Merry 2010: S208).

Archaeologists engage in the above range of activities. In addition, both archaeologists and anthropologists organize public engagement campaigns. Archaeologists organize the National Archaeology Week in Australia, the National Heritage Week in Ireland, and Heritage Open Days in the United Kingdom. In addition, there is a World Anthropology Day in the United States, and in 2014, the Committee on Public Policy for the American Anthropological Association raised the idea of a National Anthropology Week. Supported by volunteers, these events aim to increase public understandings of the discipline.

The integration of archaeology into school curricula has the potential to give archaeological concepts and knowledge broad research and long-term sustainability. This has occurred in many countries with varying degrees of success. An outstanding example, however, is Ireland, where archaeology has been taught as a subset of history in the primary school curriculum for many years. In 2005, the It's About Time! resource pack was launched, as part of a joint initiative between the Department of Environment, Heritage and Local Government and the Department of Education, to incorporate Archaeology. There are three themes: worship and commemoration, lifestyle and living, and archaeology at work. In 2018, this program is still running strong (Limerick Education Centre 2018). Sustainability and reach were also the focus of curriculum reforms at primary school level in the Petén region of Guatemala, where Patricia McAnany and Sarah Rowe have partnered with education and ecology specialists to develop new content and activities that met the standards of the Guatemalan Ministry of Education. The materials they developed emphasize conservation and respect for the rich natural and cultural heritage in the region and for the traditions and knowledge of Indigenous Maya peoples. Archaeological approaches to Maya cultural heritage are presented as one way of learning about the past. McAnany and Rowe observe that archaeologists and the people they collaborate with need to think carefully about how to match the scale and scope of educational programs to the type of collaborative project. In addition, they note that educational programs about the goals, methods, and discipline of archaeology are often required, at the same time that archaeologists must educate themselves about the local context and concerns of the community (McAnany and Rowe 2015).

Field schools that involve public education are another example of engaged archaeology. In North America, and elsewhere, there is a long tradition of archaeological field schools taken for credit at universities, aimed at teaching the methods of field archaeology. Recently, these offerings have been augmented by field schools that take an engaged approach. Such field schools offer a two-way engagement: teaching university students how to work appropriately and ethically with Indigenous and community groups and at the same time assisting those groups to achieve their research goals. One example is the field school on Field Methods in Indigenous Archaeology which is convened by the University of Washington in collaboration with the Confederated Tribes of Grand Ronde. In addition to imparting skills

from a community archaeology toolkit onto its students, this field school "seeks to strengthen the tribe's capacity to care for cultural resources, to recover histories of survivance on the Grand Ronde Reservation, and to develop a low-impact, Grand Ronde archaeological methodology" (González et al. 2018: 85).

The longest-running field school in Australia is the Barunga Community Archaeology Field School. It has been held at the community of Barunga, Northern Territory, annually since 1998. While it is led by Claire Smith, Gary Jackson, and Jordan Ralph, the individual teachings are given by community people. The aim of the field school is for students to experience working with Aboriginal people from remote communities and to learn how to produce a research product that is wanted by the community. The products range from reports on rock art sites and cemeteries to recording the sporting achievements of local people and oral histories. Students have to work closely with their Aboriginal teachers to achieve the research outcomes required to pass this topic. In addition, they are encouraged to share their own background with community people, bringing the wider world a little closer to a remote community (Fig. 2). Though it is much wanted by the community, each year convening this field school is a challenge (see Smith et al. 2020). The difficulties involved in field schools undertaken with Aboriginal peoples are discussed by May et al. (2018), who discuss some of the complexities of training students to work in Indigenous communities where cultural belief systems are still strongly linked to sites and landscapes. The central challenge they identify is a challenge for engaged archaeology in general:

> In essence, the question remains – are community archaeology field schools worth the effort? In our opinion they are of immense benefit to students and can help prepare them for a career in archaeology. However, the pressure faced by communities and staff running the field schools is great and, with ever-increasing demands from universities to teach and publish, the biggest obstacle to make these programmes a success is the time needed. (May et al. 2018: 13)

Engaged Archaeology, Fig. 2 Nell Brown and Meghan Di Vito from New York. Barunga, Northern Territory, Australia. July, 2019

Social Critique

Low and Merry (2010: S209) identify social critique as a form of engaged anthropology, which "refers to anthropological work that uses its methods and theories to uncover power relations and the structures of inequality" (see also Low 2016).

An outstanding archaeological example of social critique as a form of engaged archaeology is the work being undertaken on the archaeology of homelessness. In the United States, Zimmerman and Welch's (2011) Homelessness Project uses archaeology to understand the lifeways of homeless people. They found that the movement of homeless people across a landscape produces reasonably predictable patterning in material culture. This led to an understanding that populations often thought of as itinerant were actually settled long-term within a particular area and that homeless people create communities with recognizable settlement patterns. This study shed new light on those on the margins society, upon whom government policy and police attention are often focused, yet little is known about day-to-day lives. The researchers observe that "the problems caused by well-meaning parishioners or exasperated city officials are based on assumptions about the material culture of homelessness that archaeological approaches can at least clarify" (Zimmerman and Welch 2011: 81). In this sense, the ways in which groups and lawmakers have interacted with and imposed upon homeless people are based on

creating equality through the distribution of material culture (which may not be suitable for homeless people, but fits what the donor may see as befitting a "homed" person); or the removal of what might look like "trash" to local government officials might be a prized possession or necessary medications (in which case, the ramifications could be dire, if, e.g., the medications were required to sustain life or maintain "psychological balance") (Zimmerman and Welch 2011: 82). This type of engagement makes it possible to illuminate the multifaceted narratives of homeless people, including the forces that result in their homelessness, as well as those that keep them there. In all, the Homelessness Project is engaged in making the lives of homeless people better in a modern world. As Zimmerman and Welch (2011) state, archaeology can clarify the judgments brought upon homeless people. Moreover, policies around homelessness can be informed by this new information and clarity, which can, in turn, effect real change for homeless people.

In Australia, Kellie Pollard found that homelessness in the urban, rural, and hinterland areas of Darwin, Northern Territory, left distinct patterns in material culture due to the traditional living practices of Aboriginal people whose communities of origin are remote from major metropolitan centers. In Darwin, homeless Aboriginal people live on the fringes of society in a space colloquially referred to as "the long grass." The long grass in urban and rural areas is buildings, reserves, recreation parks, creeks, rainforests, and coastlines, extending to inland waterways and uninhabited bush in the hinterland. Aboriginal homelessness in the long grass shares some features in common with other countries, such as the recycling of charitable or discarded goods by citizens and the reuse of these goods in new and innovative ways. This suggests Aboriginal people who are homeless seek an enhanced quality of life as much as housed people do. However, homelessness in the long grass has some unique aspects – Pollard (2018) demonstrates that the material remains of Aboriginal people in the long grass reflect a cultural epistemology that encompasses land use and settlement and dietary patterns. Unlike homeless people in Zimmerman and Welch's (2011) study in the United States, or Kiddey and Schofield's (2011) study in the United Kingdom, Aboriginal people in the long grass practice hunting and gathering in a metropolitan context as a continuity of customs and traditions. In the long grass, Pollard found evidence of a diverse range of bush foods (terrestrial and marine) that testify to Aboriginal ecological knowledge and how homelessness correlates with traditional land use and settlement patterning. This knowledge and life skills assist homeless Aboriginal people, who are overwhelmingly on welfare support, to not starve and to eat healthy bush foods instead of highly processed carbohydrates. The studies of the material aspects of homelessness deeply interrogate the "structures of inequality" identified by Low and Merry (2010).

Collaboration

Low and Merry (2010: S209) identify collaboration as another element of engaged anthropology that "ranges from participation in the research site to collaborative leadership through action research." The authors stress that collaboration depends on the researcher assuming a supporting role, rather than a leadership role. While in anthropology this requires the researcher to fit in with a community to understand how it functions, it is possible to conduct archaeology without actively collaborating with a community. In current practice, collaboration is a thread that crosses all categories (but not all examples) outlined in this entry. It can broaden the intellectual richness of a project at the same time that it addresses issues that are of importance to local communities. Collaborations produce changed relationships, which engender their own challenges. Low and Merry (2010) comment on the trend from people being the subjects of research to becoming collaborators, co-researchers, and colleagues. This is certainly true of archaeology, and this collaboration has engendered profound changes, not only in practice but also in aspirations and community expectations. Isaacson and Ford (2005), for example, call for archaeologists to commit to a shared future by engaging with the daily challenges that face the people with whom they work:

> If archaeologists can bridge the barriers that traditionally separate private and professional lives, the

> future of the Indigenous community in which they work becomes a future in which they have a vested personal interest. If archaeologists see the Indigenous people with whom they work as more than just subjects of research, then archaeologists can no longer be silent observers to the problems Indigenous communities face every day. (Isaacson and Ford 2005: 361–362)

Today, collaboration is a disciplinary standard in the conduct of social archaeology in many parts of world, not only during fieldwork, but in identifying key aims, developing a research project and during analysis and reporting. As Chip Colwell writes:

> in the past half-century, archaeology's relationship with the public has dramatically shifted, from a scientific enterprise with modest concerns about its relationship with the public, to a view of public education as an obligation but one-directional, to a form of fully engaged community-based action. (Colwell 2016: 113)

The engaged archaeology that we conduct with the Barunga community in the Northern Territory, Australia, produces collaborations, and research products move beyond pure archaeology, or even anthropology, to encompass a wide range of issues relating to community health, well-being, and education. At the time of writing, our core research includes a burgeoning collaboration with then Royal Flying Doctor Service around culturally informed dental health (Fig. 3), while our community service includes surmounting the many, many, many hurdles involved in the renewal of a community member's passport (Fig. 4). Increasingly, we find ourselves taking on the role of culturally informed facilitators of better health care, education, and employment.

Advocacy

Low and Merry (2010) identify advocacy as another form of engaged anthropology. This includes "working to assist local communities in organizing efforts, giving testimony, acting as an expert witness in court, witnessing human rights violations, serving as a translator between community and government officials or corporations, and helping local groups use international principles such as human rights by working to vernacularize them" (2010: S210).

Engaged Archaeology, Fig. 3 Visit by the Royal Flying Doctor Service to Barunga, Northern Territory, Australia. July, 2018

Engaged Archaeology, Fig. 4 The number of people directed involved in obtaining the renewal of Adam Macale's passport. Front row (left to right): Jordan Ralph, Lily Friday, Jessala McCale, Adam Macale, Claire Smith. Back row (left to right): Mia Dardengo, Gary Jackson. Mel Rosso from Melbourne and Jo Smith from Newcastle are represented by express post envelope held by Claire Smith. Katherine, Northern Territory. July, 2019

Within the context of Indigenous archaeologies, Wobst (2005) calls for the empowerment of Indigenous voices and perspectives. The need applies more generally, especially in relation to colonized peoples or those with a history of enslavement. The work undertaken by Edward González-Tennant (2010) addresses this challenge in terms of African Americans. His Rosewood Heritage and Virtual Reality Project (González-Tennant 2010, 2018) highlights the capacity of engaged archaeology to make a difference to areas that have received little archaeological attention, such as that of race riots, and through this, to give voice to people whose voices have been dismissed or overlooked. This project engaged a variety of community-centered strategies as forms of truth-telling. These included a website, public talks, and immersive experiences. Working with a heterogeneous group of survivors, descendants, and interested parties, the descendants of the Rosewood Massacre and their advocates embraced the potential offered by new media and helped design new applications. González-Tennant records that by partnering with redress groups at the University of Florida, it was possible to raise awareness of ongoing social inequalities (including other violent, ongoing chapters of Florida's white supremacist history). One aim of the project was to provide a suite of techniques that could be transplanted to other contexts and aid reparations activists with new forms of persuasive data for their social justice work (González-Tennant 2010: 48).

Effective advocacy allows peoples to express their views themselves, rather than through a third party, and can be enhanced through the targeted analysis of material culture. Working with Aboriginal communities of Barunga, Manyallaluk, Beswick, and Werunbun in the Northern Territory, Australia, Ralph and Smith (2014) analyze the effects of a major government intervention on community health and well-being. The Northern Territory Emergency Response, known as the Intervention, was so radical that the government had to lift the protections of the Racial Discrimination Act. It included blanket bans on alcohol and pornography; a reduction and quarantining of welfare payments; the removal of customary law and cultural practice considerations from bail applications and sentencing within criminal proceedings; removal of the permit system which stopped non-Indigenous people entering Indigenous land; and abolishing the Community Development Employment Project, which employed hundreds of Indigenous people. At the request of the community, Claire Smith, Gary Jackson and Jordan Ralph

helped to coordinate and assess Aboriginal responses to the Intervention. In 2007, Smith and Jackson worked closely with Barunga community to organize a series of public forums across Australia, in which community speakers spoke directly about the impact of the Intervention on the physical and mental health of community members (Fig. 5). In 2010, Jordan Ralph conducted research on the impact of the Intervention in relation to road signs. While protest signs might have been expected, Ralph found that no instance of the new Intervention signs being defaced. To the contrary, he found that signs relating to the government intervention had minimal graffiti compared to other road signs. Given that graffiti is common on other forms of signs, interpret this as indicating that Aboriginal people felt unsafe writing graffiti on government signs. This, in turn, suggested that cross-cultural encounters, especially encounters with government agencies are viewed as unsafe by Aboriginal people, a finding that has "clear policy implications . . . for a government that is encouraging Aboriginal people to integrate more fully with the wider Australian society" (Ralph and Smith 2014: 82).

Motivated by a shared concern with social justice and human rights, another, slightly more indirect, use of archaeology is to advocate for the protection of the heritage places of colonized peoples, particularly in the face of industrial or urban development. Two Australian examples of archaeological advocacy are McDonald and Veth's (2009) work on the rock art of the Dampier Archipelago in Western Australia and Cole and Buhrich's (2012) work on the Quinkan rock art, near Laura on the Cape York Peninsula, QLD, Australia. The rock art of both regions was under threat from mining operations and, to a varying extent, tourism. In the Dampier, McDonald and Veth (2009) provided the first thorough analysis and contextualization of petroglyph sites across the Archipelago, which they compared to other art style provinces in the Pilbara. Their research was undertaken in support of the nomination of the Dampier Archipelago to the National Heritage List, achieved in 2007, and the current positioning

Engaged Archaeology, Fig. 5 Irene Fisher, CEO of Sunrise Health Services Aboriginal Corporation speaking at a public forum in Melbourne, Australia, 2007

of this region for World Heritage nomination. In terms of Quinkan Country, Cape York, Cole and Buhrich (2012) discuss the complexities and pitfalls of heritage legislation in Australia, writing that "it can be difficult for people who are not members of a registered native title application or a registered Aboriginal cultural heritage body, and who are unresourced, to be proactive in attending to their rights and responsibilities under the [Aboriginal Cultural Heritage Act 2003 (Qld)]" (Cole and Buhrich 2012: 73). Their advocacy highlights a culturally harmful situation, in which the protection of Aboriginal places from development depends upon being part of a formally registered, well-resourced group. In November 2018, the researchers' collaborative efforts with the Ang-Gnarra Aboriginal Corporation resulted in Quinkan Country on Cape York Peninsula being added to the Australian National Heritage register on the basis of its distinctive rock art and habitation over at least 34,000 years.

Activism

The final form of engaged anthropology identified by Low and Merry (2010) is activism. They write that "advocacy is not easily distinguished from activism. Both can draw on a person's knowledge and commitments . . . but activism also builds on commitments as a citizen or as a human confronting the violations or suffering of other humans" (Low and Merry 2010: S211).

One way in which archaeology engages with communities to redress the suffering and violations inflicted upon others is by shedding new light on Eurocentric, androcentric, xenophobic, and racist ways of thinking. Locating their work within the framework of a social justice-oriented public archaeology, Westmont and Antelid (2018) provide an inspiring demonstration of how archaeology can be used to enhance the social integration of migrants. They outline two community archaeology case studies in Sweden and the United States in which interpretations that emphasized participants' connections to lived experiences within places were prioritized over interpretations that favored biological connections to previous populations. They identify methods, observations, and approaches that can be adapted for other projects aimed at contributing to more cohesive societies. In the process, they demonstrate how community archaeology can be adapted to address contemporary social issues. The authors conclude that:

> When properly framed, public archaeology can be a force for reckoning with the historical exclusivity of archaeological interpretations. Our projects illustrate the ways that public archaeology can be a means for encouraging integration efforts by providing migrants with a sense of belonging. Archaeological narratives have the potential to change identities derived from heritage from people-focused to ones that are place-focused instead. This shift in emphasis can be used to integrate disparate populations through encouraging collaborative and inclusive versions of the past. If public archaeologists can successfully demonstrate the ability of archaeology to bring people together to overcome their social differences and see each other as equals with equal claims to an area's heritage, as we sought to do in our work, the value of heritage will be upgraded for society's purposes. (Westmont and Antelid 2018: 246–247)

International Perspectives

From an international perspective, how has engaged archaeology developed over the last decade or so? Internationally, engaged archaeology covers the full spectrum of practices outlined by Low and Merry (2010). Most examples are individual studies. Most examples of engaged archaeology are community-based. There are few broad, thematic approaches which deal with issues that are important to many communities or aim to address broad or overarching problems. A significant example of a thematic approach to engaged archaeology is the Intellectual Property Issues in Cultural Heritage project, which was directed by George Nicholas, of Simon Fraser University, in British Columbia. This collaboration of scholars, students, heritage professionals, community members, policy makers, and Indigenous organizations was funded from 2008 to 2016 by the Social Sciences and Humanities Research Council of Canada. Over this period this group intensively explored a range of case studies in relation to the rights, values, and responsibilities of material culture, cultural knowledge, and the practice of heritage research (IPinCH 2018). The focus on collaboration made it possible to address pressing cultural heritage challenges in specific contexts. The research themes were

Bioarchaeology, DNA, and Indigeneity; Commodifications of Cultural Heritage; Community-Based Cultural Heritage Research; Cultural Tourism; Safeguarding Indigenous Heritage; Indigenous Peoples, Cultural Heritage, and the Law; and Indigenous Research Ethics.

Around the globe, the emergence of an engaged archaeology has coincided with increased recognition of the urgent need to preserve oral histories as well as the capacity of oral histories to inform archaeological research and reorient archaeological thinking toward new research questions. The potential for core aspects of oral traditions to endure through time is highlighted in a recent study by Patrick Nunn and Nick Reid that identifies congruences between Aboriginal oral traditions and scientific evidence of sea level rises from 7,250 to 13,070 years ago at 21 sites around the Australian coastline (Nunn and Reid 2016). Sometimes, oral histories can identify new research questions. Pig Island (Nimowa) in the Massim island region of eastern Papua New Guinea, for example, is named after an oral history that refers to when Indigenous people arrived on the island to find it uninhabited by people but overrun by pigs, which must have been introduced to the island by people at a prior time in the past. This oral history traces the lasting impact of changing sea levels on the later dispersal of people into island regions and highlights the process of abandonment and resettlement in these regions (Ben Shaw email comm. 30 October, 2018).

The critical role that archaeologists can play in preserving oral histories in situations of social change is clear in Peter Schmidt's book *Community-Based Heritage in Africa* (Schmidt 2017), which describes the circumstances in which he was requested to undertake oral history research. The importance of preserving oral traditions has informed other archaeological work in Africa and elsewhere. Working closely with Indigenous communities on the Makgabeng Plateau in South Africa, Catherine Namono has used digital technologies to collect and document the oral heritage of previously marginalized voices and used this information to shape in heritage and historical narratives for rock art heritage tourism (see Namono 2018). She sees this as one way of redressing the dominance of literary heritage narratives of African heritage that marginalize the African cosmologies and oral traditions which are the intangible values of place that attract visitors to heritage sites. An addition value of this project is that "oral heritage narrated through stories, songs, dances and poetry and collected using digital technologies will help preserve African values threatened by the onslaught of Western ones, especially through written European languages and social media" (Namono 2018). We anticipate that the collection of oral histories will grow in importance as archaeology becomes more fully engaged with producing outputs that are sought by communities.

In Latin America, the trend toward an engaged archaeology is exemplified in a project in Olavarría, Buenos Aires province, Argentina, run by María Luz Endere, María Gabriela Chaparro and María Eugenia Conforti (2018). An itinerant exhibition was developed to promote public access to scientific knowledge and community awareness of the significance of the natural and cultural heritage of Olavarría. Though the program continued successfully over 7 years, the researchers highlight the need to increase stakeholders' participation in such projects and to explore new communication strategies to engage different segments of the public. Elsewhere, McAnany and Rowe (2015) discuss examples of the forms that an engaged archaeology can take from the Maya region in Guatemala. They point out that collaborative research poses new challenges as relationships change and communities become research partners and archaeologists have abandon their role as sole architects and stewards of the past. However, the difficulties that arise are more than offset by dramatically improved prospects for conservation and the enhanced relevance that accompanies this transformation. They argue that "it is a challenge – perhaps the grandest of all – to shape the study of humankind into an endeavor of unquestionable relevance" (McAnany and Rowe 2015: 7).

Future Directions

In many ways an engaged archaeology mirrors developments in social and cultural anthropology. This comparison of engaged archaeology in terms

of the categories outlined by Seth and Low (2010) shows that all of these categories have clear examples in archaeology. The examples discussed in this chapter demonstrate some of the ways that engaged archaeology can produce a richer, broader experience – for both archaeologists and communities.

What might be the future for engaged archaeology? Firstly, we expect that it will become increasingly interdisciplinary. Engaged archaeology often entails stepping beyond disciplinary boundaries in response to the priorities and agendas of different stakeholders. This involves breaking down barriers between archaeology and cognate disciplines such as history and anthropology, critiquing the distinction between researcher and subject and between professional and personal lives. Often, it involves archaeologists using their disciplinary skills for purposes that are not strictly archaeological, such as using their grant writing skills to raise funds for community projects. Moreover, archaeologists may have to acquire a suite of non-archaeological skills to address the issues facing the communities with whom they work.

Secondly, we anticipate that archaeological practice will continue to be shaped by the communities with whom archaeologists work. The examples discussed in this chapter demonstrate how archaeology can be enriched by its intersecting communities and how they can shape archaeological practice without compromising robust interpretations of the past. The major change is that archaeologists have moved beyond recognizing the social and political contexts of archaeological interpretations to shaping archaeological practice according to the values, visions, and agendas of those with whom they engage.

Thirdly, there is likely to be a greater emphasis on the co-production of shared knowledge, with archaeologists having less overt control over the direction and day-to-day practice of engaged archaeological projects. The benefit from this is that increased engagement with communities will highlight the value of archaeology to those communities, providing long-term protection of sites and long-term relevance for the discipline.

Fourthly, the broadening and deepening of experience that comes from actively engaging with another's concerns will continue to enrich relationships between archaeologists and community members, offering new opportunities for knowledge production and intellectual service (e.g. Chesson et al. 2019).

Finally, since engaged archaeology is intimately involved with the social and political issues of the day, it will continue to intersect with social justice and human rights issues.

E

Cross-References

- ▶ Applied Archaeology (Including Activist Archaeology)
- ▶ Community and Archaeology
- ▶ Community Archaeology
- ▶ Communicating Archaeology: Education, Ethics, and Community Outreach in North America
- ▶ Community Engagement in Archaeology
- ▶ Homelessness, Archaeology of
- ▶ "Public" and Archaeology
- ▶ Public Archaeology, The Move Towards

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Engendered Archaeologies

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Introduction

Feminist principles made a formal entry into archaeology in the late 1970s, as scholars – the majority of whom were women – began to draw attention to the androcentric biases implicit in archaeological interpretations of the past. Further, these writers noted the degree to which similar patriarchal biases shaped the political economy of the discipline itself, to the general disadvantage of women. In the years to come, these early sociopolitical concerns would be expanded upon by subsequent feminist and queer archaeologists, who in addition identified heterosexist biases in the discipline. These authors called for a better representation of women, men, and others in the past (which had its own political implications in the present) and a commitment to improving the presence of women and sexual minorities among the practitioners of archaeology. This "double politics of representation" has often been acknowledged as the main – or even the only – contribution of these archaeologies. Yet, without downplaying the importance of representation, it should be noted that engendered archaeologies have significantly improved archaeology in general through the provision of alternative historical interpretations, the promotion of self-criticism and reflexivity within the discipline, and the development of new practices and fields of inquiry.

Definition

The term "engendered archaeologies" designates all those archaeologies that explicitly problematize sex, gender, and/or sexuality in interpretations of the past and/or in the practice of the discipline itself. This term, therefore, encompasses the complex spectra of feminist, gender, and queer archaeologies. Although these archaeologies may overlap frequently in terms of theory, practice, and/or politics, it would be wrong to think that they always do so, as will be discussed below.

Historical Background

The Development of Feminist Archaeologies

During the final years of the 1970s, a significant number of archaeologists entered into the debate on discrimination against women, and programs were developed to provide a better representation of women, both in the past and in the discipline itself. These developments were associated with the near-simultaneous arrival of "second-wave" feminism in the archaeological communities of Norway, Britain, and the United States and its rapid spread to other areas of the globe. In Europe, the Norwegian workshop "Were they all men?" (convened in 1979, though only published in 1987 (Bertelsen et al. 1987)), the journal and network K.A.N., and the TAG session "Feminist Perspectives on the Past," celebrated in 1982, were among the first avenues for such objectives. In the United States, the authors of the "Woman the gatherer" movement in anthropology, in direct response to the success of the landmark 1966 "Man the

hunter" conference and later book of the same name, identified sexist biases behind scientific production and pioneered the study of the female role in the history of humankind.

In the 1970s, it was salient to recognize that prevailing conceptions of the past reflected particular researchers' perspectives, disfavored women, and legitimated hegemonic gender ideologies. Following the emergence of feminist women's studies, many archaeological works aimed to make women visible, a logical effort to reestablish balance after several decades of neglect and stereotyping of women in the past. But also from the outset – at the height of processualism and with culture history as a predominant background – the critique of patriarchal bias brought to the fore the "science question" in our discipline, initiating a debate that would find its full force from the 1980s onward in the heterogeneous perspectives of postprocessual archaeology.

Gender as a Concept in Archaeology

Fundamental to the advancement of feminist archaeologies was the incorporation of gender as an analytical category for the study of the past. Strongly rooted in feminist gender and women's studies in 1970s sociocultural anthropology, the concept of gender first entered archaeology in the 1980s, both in the United States (Conkey and Spector 1984) and the United Kingdom (see 1988 volume 7 (2) of the *Archaeological Review from Cambridge*). In previous years, gender had provided a term to disentangle the biological from the sociocultural, allowing one to refer explicitly to the interpretation – cultural, historical, and constructed – of sexual difference, which was seen as natural, fixed, and inevitable. On one hand, the study of women was released from essentialist background assumptions about "human nature." On the other hand, since gender was not biological and invariable, it offered a proper subject for archaeological research.

When archaeologists first began to discuss gender, the general goal was to engender the discipline (Conkey and Spector 1984). The critique of sexism and androcentrism continued, widening paths opened in previous years. Equity issues and gender roles in professional archaeology came to occupy positions of prominence on the research agenda (Gero 1983) and have continued to be highly relevant since (see, for instance, Bardolph 2014; Dıaz-Andreu and Sørensen 1998; Lazar et al. 2014). Likewise, additional male biases in archaeological interpretation and presentation – verbal and nonverbal – were scrutinized (e.g., Gifford-González 1993; Fries et al. 2017 for a recent one). As a result, women have been portrayed as active agents in many domains previously considered exclusively male. By the same token, traditional female activities have come to be considered fundamental to understandings of historical dynamics (Brumfiel 1991; Monton-Subıas and Sanchez-Romero 2008). Also important from the outset, early gender archaeologists recognized that reflection on what the concept of gender might mean for archaeological interpretation was a prerequisite to any progress, as were questions concerning epistemology and the production of archaeological knowledge (Spector 1993; Wylie 1992).

Following the precedent set by the 1979 Norwegian conference, the 1980s and early 1990s witnessed the first gender- and/or woman-focused meetings in several different countries. In England, following TAG sessions in 1982, 1985, and 1987, the Cambridge Feminist Archaeology Workshops took place in 1987–1988. The conference "Women and Production in Prehistory" – foundation for the groundbreaking volume Engendering Archaeology (Gero and Conkey 1991) – took place in the United States in 1988. The German Tübingen seminar was convened in the same year. These early meetings were followed in 1989 by the XXII Chacmool Conference in Canada, in 1991 by "Women in Archaeology" in Australia, and in 1992 by a R.A.T. session on "Archaeology and Women" in Spain. Although contextually situated in specific and substantially different academic environments, all of these meetings originated from the experience of being female in archaeology and confronted dominant archaeologies. They acted as "standpoints," where scrutiny and reflection on androcentrism were transferred from individuals and local groups to wider national and/or international communities. They were often the

first among a series of meetings, providing much-needed reference – both within the countries where the sessions convened and around the world – for many women archaeologists who had personal experience of sexism.

Since the 1980s, numerous authors have illustrated, revised, and put forward increasingly more nuanced views of gender in archaeology. Some of these scholars have been significantly influenced by developments in American third-wave feminism and have built substantially upon earlier themes, often related to the shifting and intersecting elements of personal identity in the past. Among these elements is sexuality, and one of the major contributions of third-wave feminism to archaeology has been a critique of heterosexism, another form of patriarchal bias.

Archaeologies of Sexuality and Queer Archaeologies

Issues of sexuality have long been on the feminist agenda. Important events of the 1960s – from the near-simultaneous approval of oral contraceptives for use in the United States, the United Kingdom, and West Germany in 1960–1961 to the police raid of New York's Stonewall Inn in late-June 1969 – thrust sexual desire and practice (both heterosexual and homosexual) to the forefront of public debate. Yet, while some authors of the 1970s, like Kate Millet, Carla Lonzi, Gayle Rubin, and Michel Foucault, among others, did address issues of sexuality, sustained discourse on the topic would not develop within academic feminism until the 1980s.

Within the discipline of archaeology, sexuality has always been implicitly programmed into interpretations of the past, and most archaeologists recognize sexual activity as an essential feature of past societies. Despite its importance to the reproduction of both bodies and cultures, sexuality has been largely absent from archaeological discourse until recently. In the introduction to *Archaeologies of Sexuality*, Schmidt and Voss (2000, following Rubin 1984) identified several factors that have significantly impeded sexuality research within archaeology. These include the assumptions that sexual behavior is biological and, as such, both invariable and ahistorical; that discussions of sex are bad or inappropriate; that monogamous, heterosexual sex is more legitimate than other forms of sex; and that the sexual mores of past cultures were identical to those of the researcher's own culture. Unspoken behind these assumptions is the notion that sexual activity in the past was always primarily procreative that it was, therefore, above all else, heterosexual. In the age of social media, the continued allure of these assumptions is made clear on a regular basis. Every few months (it seems), the popular media highlights an expert's "new find," the interpretation of which suggests some kind of lustful or nonnormative activity in the past, and the general public attaches itself in puerile fascination.

In the 1960s and 1970s – closely paralleling broader debates about homosexuality initiated by the Stonewall riots – classical scholars in philology and history began to address culturally sanctioned male homosexual relations, a common feature of ancient Greek and Roman societies about which they had remained relatively silent for more than a century. Yet, despite the potential of classical and other material culture to support an "archaeology of homosexuality" which might challenge the heterosexism implicit in mainstream archaeology, early attempts to do so often fell into the trap of reinforcing contemporary Western sexual politics, either associating past homosexuality with deviance or searching too hard to demonstrate a long history for the existence of homosexual identities similar to those of today.

Recognizing the degree to which attempts at an archaeology of homosexuality naturalize contemporary Western social values, a number of scholars (e.g., Dowson 1998) have called for the development of a "queer archaeology" that aims to break away from the essentialist and normative heterosexist constructions employed in traditional archaeological interpretations and from normative structures that guide the discipline itself. Over the past 20 years, such efforts have resulted in several published papers, conference sessions, and even dedicated queer archaeology interest groups within national and regional professional associations. Many of these efforts to apply queer theory to the study of the past have nothing to do with sexuality (see Blackmore 2011).

Key Issues/Current Debates

During the 1980s and 1990s, gender archaeologists generally accepted the sex-gender dichotomy. Studies aimed at investigating how gender systems were constructed and organized and how gender acted in structuring societies. Separate case studies highlighted the different – though interrelated – aspects of multifaceted gender systems: from gender relations (gendered roles and activities) to gender identity, through gender symbolism and ideology. The interest in such topics has continued and even grown since that time.

In light of ethnographic and ethnohistoric data, including studies of Native North American two-spirits, Indian hijras, and eunuchs, archaeologists have noticed that societies may have existed in the past with more than two gender identities (for instance, see Hollimon in Nelson 2006). The focus on gender identity has also fostered insights into the intersection of gender with other types of social ascription, mainly age, race, class, ethnicity, faction, and sexuality (Meskell 2002; Wilkie and Howlett Hayes 2006: 248–250). An incipient concern with intersectionality in archaeology gained greater attention in response to developments outside the discipline, as third-wave black feminists in the United States claimed that gender needed to be analyzed alongside other forms of identity (see Franklin 2001; Battle-Baptiste 2011; Battle-Baptiste 2011 for archaeology). Of these, studies of age – particularly of childhood – have been especially common in archaeology. The early feminist agenda to include "small issues" in archaeology, and so individual human beings, already embraced the study of children in the past (see Lillehammer in Bertelsen 1987). Since that time, numerous works have followed, even leading to the development of an independent field of inquiry – sometimes without reference to feminism or gender – with an organization of its own: the Society for the Study of Childhood in the Past (http://www.sscip.org.uk/).

Over time, reflexivity about gender identity has also come to include explicit reflections on the construction of the masculine self. More and more men have discovered that they also have gender. They have manifested an open discomfort with – and even an active rejection of – the gender roles attributed to them by contemporary patriarchal hegemonic masculinity. In response to this development, and with the inspiration of sociologists like R.W. Connell and V. Seidler, discussions of masculinity have appeared in archaeology (Knapp 1998; Spencer-Wood 2006: 319–321). Some authors have focused on how specific forms of dominant masculinity – usually associated with violence and warfare – were constructed in the past, while others have questioned the very existence of these forms of masculinity in light of archaeological data (for instance, Alberti in Nelson 2006). Such cases provide increasing evidence of how contemporary gender assumptions are read onto the past, impacting not only our understandings of women but also of men and of the broader societies in which they both participated. With each new study, it becomes clearer that the condition deplored by the first feminist archaeologists is pervasive, with more far-reaching effects than originally imagined.

Since the mid-1990s, scholars have started to reevaluate the sex-gender dichotomy. While many continue to accept the distinction as originally formulated, some archaeologists have begun to complicate the sex-gender dyad. Such efforts are guided mainly by the biomedical critique of binary sexual systems provided by Fausto-Sterling and by the notion – advanced by scholars like Laqueur, Wittig, and Butler – that there is no distinction between sex and gender, given that Western notions of sex and sexual difference are also socially constructed and contextually dependent. It is important to distinguish these treatments of sex and gender from another tendency that remains common in archaeology as well as in other disciplines: to use the terms "sex" and "gender" interchangeably while leaving the relationship between the two undertheorized. Here, gender becomes a proxy for the traditional notion of woman (and sometimes also of man).

The influence of poststructural theory on archaeology is perhaps best seen in studies questioning the idea that a stable gender is constructed upon a stable sex and highlighting the remarkable variation in human sex-gender systems (Yates 1993). Many of these studies have further introduced a theoretical interest in the body, embodiment, and sexual identity (see

Joyce 2005) and have yielded alternative interpretations, as is particularly evident in the study of iconography.

As might be expected, archaeologists hoping "to queer" the discipline have also demonstrated marked interests in the body, embodiment, and sexual and gender identities and have reexamined a number of traditional topics. For example, in the issue of *World Archaeology* (32[2]) dedicated exclusively to queer archaeology (published in October 2000 with Thomas Dowson as guest editor), contributors discussed homophobia within the practice of archaeology itself; new ways of seeing, reading, and/or experiencing the iconography of past cultures (especially with regard to understanding sexuality in the past) and of presenting such alternative readings and experiences to the broader public; the possibilities of identifying past sexual relationships from nonrepresentational artifactual material; and the relationship between archaeology and other disciplines that take an interest in the materiality of the human body (e.g., biotechnology and genetic engineering). What became clear from many of these papers – mirroring earlier feminist critiques – is that the physical body of the archaeologist is often as important to his/her interpretations of the past as are the bodies of the long-dead people he/she studies. Subsequent work, both published and presented at major conferences (including those of the Society for American Archaeology, the American Anthropological Association, and the European Association of Archaeologists), has kept the contemporary politics of the discipline in focus and continued to advance "alternative ways of seeing" iconographic and artifactual material. In addition, queer archaeologies have expanded to include critical examinations of subjects as diverse as relations between the living and the dead, the gendered division of labor in the past, and consequent impacts on the use of the landscape by individuals of different genders (as can be seen in *World Archaeology* 37 (4) and Meyer forthcoming). Notably, the destabilization of the polarity between biology and culture (provided by both gender and queer archaeologies) has stimulated important reflection in bioarchaeology. For example, Geller (2009) has drawn attention to the degree to which the practice of sex determination – whether from the gross examination of skeletal remains or, more recently, from studies of ancient DNA – has tended to read cultural meaning onto past biological difference, effectively conflating "sex" with "gender" and generally reinforcing the dominant sexist, cisgendered, and heteronormative discourses of the present. Recent efforts to craft a "transgender archaeology" (e.g., Weismantel 2013) have carried all of these reflections even further.

The 1979 Norwegian workshop called for an individual-inclusive archaeology in contradistinction to dominant archaeologies that were either artifactualist or focused mainly on abstract social categories and broad processes (Bertelsen 1987). Subsequent feminist inquiry in archaeology has continued to emphasize the importance of human agency and other variables to understandings of historical dynamics in the past (Dobres and Robb 2000). These other variables are best viewed at the local scale, often through a focus on daily life and quotidian activities (Brumfiel 1991; Spencer-Wood 2006: 307–310; Wilkie and Howlett Hayes 2006: 250–251). Spanish feminist archaeologists, for example, have put forward the concept of "maintenance activities" to highlight the structural and foregrounding nature of a set of daily repetitive tasks required for the short-, medium-, and long-term reproduction, sustenance, and welfare of any human group (Montón-Subías and Sánchez-Romero 2008). These activities have been analyzed in a framework that articulates long-term cultural sequences with a focus on the structures of daily maintenance, thus intending to fill the mismatch between the level of macrosocial, economical, political, and ideological structures and that of specific agency. In 2000, volume 31, 3 of *World Archaeology* also proposed the study of the human life cycle to redress this mismatch.

The spotlight placed on human agency, quotidian activities, and the local scale also fostered interest in the analysis of those spaces considered to be the stage upon which everyday life was enacted in the past. Initially, this research was mainly driven by a renewed interest in the study of households. Unlike previous processual treatments of the topic, this new research saw households as pivotal to understandings of historical

dynamics, rather than as neutral spaces that simply reflected the changes occurring simultaneously in other social spaces. Through time, this revised household archaeology has come to incorporate many of the concerns raised in the broader theoretical discourse of engendered archaeologies, such as relationality and intersectionality (for a discussion, see Hendon in Nelson 2006; Spencer-Wood 2006: 312–314; Wilkie and Howlett Hayes 2006: 250–252), and has even expanded its mandate to include other similarly delimited and intimate social spaces including brothels, plantations, and farmsteads (Wilkie and Howlett Hayes 2006: 251–252). Queer archaeologies have expanded this research further through a focus on homosocial spaces, pioneered in 1994 by Roberta Gilchrist's study of medieval convents. Critical to these latter studies is the understanding that archaeologists need not necessarily – and, in fact, should not – assume that all households in the past were spaces in which social reproduction and sexual reproduction intertwined in the context of heterosexual family life.

The advancement of the themes addressed above has sparked debate about the explicit political commitment appropriate to archaeology. "Engendered archaeologies" is an eclectic term that includes feminist, gender, and queer studies in archaeology. Feminist and queer archaeologies should not simply be understood as theoretical currents within a single, bounded discipline but rather as movements that question the situation of women and sexual minorities in the broader context of contemporary society. The pursuit of an end to patriarchy – which often finds legitimation in the images of the past created by archaeology – has been a driving force in the history of these movements. This is not necessarily the case with gender archaeologies that may be disengaged from feminism, aiming instead to provide another theoretical corpus from which to gain knowledge about the past and, thus, having very different potential implications.

Although gender archaeology was born out of feminist reflections on the discipline and continues to be driven forward by feminist archaeologists, from the moment that gender became a concept in archaeology, some authors have sought to disconnect gender archaeology from feminism. The reasoning behind this disconnection has been both scientific (expressing a belief that science has to be unbiased) and strategic (in line with a belief that gender separated from feminism is less controversial and will more easily enter the disciplinary mainstream). But, ironically, those features of feminist archaeologies that these authors have held up as flawed and/or controversial might also be counted among the most important contributions of these archaeologies to the broader discipline, significantly enriching its scientific debate. An engagement with feminism has forwarded reflection on precisely what "doing archaeology as a feminist" means, following the lead proposed by Alison Wylie in the introductory article of a *Journal of Archaeological Method and Theory* (2007) special issue dedicated to the topic. The work of feminist philosophers like Sandra Harding, Helen Longino, Nancy Hartsock, Donna Haraway, and – of course – Alison Wylie has provided inspiration to a generation of researchers who seek to address interpretation in archaeology and has in turn sparked a number of important epistemological reflections on the production and transmission of knowledge in the discipline.

Some authors, for example, have explored alternative textual forms for conveying archaeological knowledge. Concerns about writing archaeology as a feminist have included more personalized ways of writing about the past, including archaeobiographies (especially in historical archaeology) and storytelling (for an overview, see Wilkie and Howlett Hayes 2006: 252). Of these, storytelling, in particular, offers suitable means to narrate the past, allowing for both the transmission of archaeological (i.e., "scientific") knowledge and the more humanistic "peopling of the past." Janet Spector's *What This Awl Means*, published in 1993, is among the most commonly cited examples of this genre, not only because Spector adopted an autobiographical tone in her narration but also because her work initiated an involvement with descendant communities (a concern also raised by indigenous archaeologies). Elsewhere, an emphasis on multivocality has led other practitioners of engendered archaeology to explore the possibilities of writing with hypertext (Joyce and Tringham 2007) and of

working with nonprofessional communities who, nonetheless, have interests in archaeological production (e.g., Bender 1998). Still other work (e.g., Tringham in Meyer forthcoming) endeavors to translate complex archaeological data into serious games for consumption by the general public, creating digital landscapes and characters that give new life to the past. In the future, it seems likely that engendered archaeology will explore these possibilities further and continue to test the boundaries of knowledge production and transmission within the discipline.

As suggested previously, the relationship between engendered archaeologies and the academic mainstream is complex and nuanced (for instance, Engelstad 2007; Montón-Subías and Lozano 2012). While some desire engendered archaeologies to be part of the mainstream and others do not (see below), such archaeologies are nonetheless subject to the perceptions and opinions of the whole archaeological community. Part of this community seems to be disinterested in engendered archaeologies. Contrary to the expectations of some gender archaeologists, obscuring ties to political feminism has done little to ameliorate this disinterest and may result in undertheorized uses of "gender" in which the concept loses its critical nature and becomes shorthand for "women." Trying to "do" gender archaeology, while stripping the term of its original theoretical and political influences, runs the risk of drawing on the same interpretive paradigms against which engendered archaeologies initially reacted.

For many practitioners of engendered archaeologies, what is fundamental is that these approaches were conceived to change the mainstream, not to be part of it. The discussion is not so much how they might be brought into the mainstream but how they might continue to change the mainstream. Many engendered archaeologies were developed with a desire to permeate the archaeological community as much as possible, altering the mainstream and building a new disciplinary culture. In this, engendered archaeologies share common goals with other archaeological movements, including Marxist Latin American Social Archaeology and postcolonial and indigenous archaeologies.

International Perspectives

Engendered archaeologies, especially archaeologies of gender, have steadily gained recognition since the 1970s. In the process, a number of gender-focused archaeology textbooks have been published (Gilchrist 1999; Nelson 2015; Sørensen 2000), journals have devoted complete issues to the subject (for instance, *Historical Archaeology* (1991) 25; *World Archaeology* (2000) 32(2); *J Archaeol Method Theory* (2007) 14 (3) and (2016) 23 (3); *Archaeologies* (2011) 7(1)), and key papers have been compiled into readers (Hays-Gilpin and Whitley 1998). Publications have covered broad geographic and temporal spectra (see part IV in Nelson 2006 and part II in Bolger 2012).

The extent to which engendered archaeologies have been adopted into local academies, however, is still restricted in terms of global geography. Differences in content and degree of acceptance vary with factors like national history, the position of feminism, and/or movement to recognize sexual minorities in society, local histories of archaeology and its dominant paradigms, academic structures, the nature of research teams, and, importantly, the efforts of individual scholars to introduce engendered perspectives into the discipline. Thus, in some regions, engendered archaeologies have already established themselves firmly, while in others they remain marginalized or simply do not exist. Having been recognized as major topics in Canada, the United States, Australia, and a few European countries (e.g., Germany, Spain, Sweden, Norway, and England), in most other places, engendered archaeologies retain a novel status and/or have not as yet made a solid impact. In many European countries, for instance, engendered archaeologies are now becoming more common (see Dommasnes and Montón-Subías 2012). But even this observation requires qualification as queer archaeologies – among the most recent forms of engendered archaeology – continue to be isolated primarily to the anglophone and Scandinavian academies. Outside of Europe, despite early contributions in the 1990s, engendered archaeologies have not yet gained a position of prominence in South and Central America. The number of gender-related

contributions is increasing, however, in the local archaeological academies of countries as diverse as Venezuela, Mexico, Argentina, Ecuador, and Colombia, among others (Navarrete 2010). Aside from South Africa, engendering archaeology has not been a priority in Africa (Folorunso 2007: 358), and, although Asian scholars are working on gender archaeology in universities in North America and the United Kingdom (see chapter 19 and 20 in Nelson 2006), its presence is much more restricted in the local academies of Asia (for instance, Dezhamkhooy 2011).

Future Directions

Engendered archaeologies have profoundly scrutinized the epistemological, methodological, and ontological foundations of archaeology and confronted sociopolitics in the discipline. In so doing, they have promoted new professional practices and offered alternative interpretations of the past based on previously neglected material culture and on new readings of well-known materials (such as art and iconography). To date, however, these archaeologies have unevenly impacted specific local academies and traditions. Consequently, engendered archaeologies face unequal challenges in the different parts of the world, and the "future directions" taken by these perspectives will vary markedly depending on the different academic contexts where they have appeared or are appearing.

The promotion of multilateral, international contacts is one avenue that might make engendered archaeologies richer in different parts of the world. Such contacts could lead to a better knowledge of and access to this kind of work at the regional level. For instance, the predominance of anglophone voices in the international discourse could lead to the wrong impression that, after the 1980s, all feminist archaeology has used gender as an analytical category. An examination of some perspectives with less global "visibility" demonstrates that this has not always been the case. For instance, Marxist feminist archaeologies have followed an alternative and independent path in Spain, drawing primarily on French and Italian feminist conceptions of sexual difference. In much of the world, discussions with the anglophone archaeological community have been the norm, often to the exclusion of connections with other active academies. Despite the geographical proximity of Spain and Germany, for example, Spanish and German gender scholars have long fostered contact with their colleagues in the UK and North America but remained mutually ignorant of one another. With this history in mind, it is important to recognize that efforts are being made to promote multilateral contacts between the practitioners of engendered archaeologies. One such effort is the Archaeology and Gender in Europe (AGE) working party of the European Association of Archaeologists (http://www.archaeology-gender-europe.org/). While AGE is primarily focused on drawing together members of the European archaeological community, it should be noted that in many areas, locally developed engendered archaeologies are now ripe enough to substantially augment intercontinental networks as well as to benefit from them.

One of the main challenges that engendered archaeologies will continue to face is in finding ways to further deepen the implications of politically committed positions and scholarship within the practice of archaeology. In the year 2018, the dominant sex-gender system in most parts of the world is still characterized by heterosexism and androcentrism, as well as by trans- and homophobia. In archaeology, the term "gender" has been adopted with much less reluctance in some circles than the terms "feminist" and "queer." Such reluctance stands as a self-evident example of how patriarchal biases continue to operate, presenting feminism and sexual identity movements as paranoid, unfashionable, no longer necessary, radical, and aggressive. Feminist and queer archaeologists know these perceptions quite well, and many decide to avoid such terms for strategic motives in grant requests, job applications, promotion-related self-evaluations, and even in their scholarly writing. In response to continued (if not always explicit) pressure, many practitioners of engendered archaeology significantly downplay the relationship of their own work to feminist studies. That so many feminist and queer scholars should feel obliged to dissimulate in this manner demonstrates the continued influence of patriarchy on the academy and suggests that engendered

archaeologies will be necessary for the foreseeable future. Last, but by no means least, a focus on the gender and sexual identities of *archaeologists as researchers* – as well as on the political, economic, and social inequalities that accompany these identities – continues to be necessary. As we move through the second decade of the twenty-first century, the gender equity papers referenced above (and others, like Geller 2016) are joined by new actions and new literature on the impact of sexual harassment and abuse in archaeology and other field sciences (e.g., Clancy et al. 2014; Muckle 2014; https://grupoarqueologiasocial.wordpress.com/2017/11/22/todas-sabemos-lo-que-pasa-en-bilbilis-el-machismo-el-acoso-sexual-y-el-abuso-de-poder-en-la-arqueologia/). The study published by Clancy and her colleagues indicates that as many as 75% of female scientists experience sexual harassment and even assault as they undertake fieldwork (including field training); and most do not know how to report this harassment. The grey literature of conference papers and PhD dissertations suggests this experience crosses identity categories, often affecting the members of sexual minorities regardless of gender. It is also commonly experienced by those with nonnormative bodies (i.e., the disabled), despite the fact that legislation in many countries explicitly aims to curb discrimination, harassment, and assault in the workplace (see, e.g., Clarke and Phillips 2011). It seems likely that these reports represent the tip of a much larger iceberg: one that no doubt affects who chooses to enter the discipline and who does not, who feels they have a voice in the archaeological community, and who remains voiceless. It must be recognized that any attempt to strip the political overtones of feminism or the queer movement (s) out of gender archaeology compromises the ability of engendered archaeologies to recognize and act against these continuing inequalities and injustices.

Cross-References

- ▶ Engendering Historical Archaeology
- ▶ Gender, Feminist, and Queer Archaeologies: A Spanish Perspective
- ▶ Gender, Feminist, and Queer Archaeologies: Australian Perspective
- ▶ Gender, Feminist, and Queer Archaeologies: European Perspective
- ▶ Gender, Feminist, and Queer Archaeologies: USA Perspective

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Engendering Historical Archaeology

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State of Knowledge and Current Debates

Gendered social relations are fundamental to the human experience. The ways in which individuals understand their roles as gendered beings and their relationships to other gendered beings both shape and are shaped by factors internal and external to the individual and the family/social/economic unit to which humans belong. Gender is also codified and experienced at multiple scales – from the household to the community to the nation (Rotman 2015) – and "rarely works in isolation from other identifying markers and means of acquiring power and status" (Jacobs 2011: 303). Colonialism, patriarchy, the capitalist mode of production, as well as other ideological, economic, and political forces have also shaped gender through time and across space. Specifically, the power relations embedded within them intersect with gender and, therefore, structure social relations in significant ways (Voss 2006: 111).

Gender is dynamic, fluid, contextual, contingent, and ever-changing. Identity, sexuality, cultural proscriptions for social roles, socioeconomic class, ethnic heritage, life cycle, and other dimensions of the cultural world create tensions between societal structures, gender ideals, and individual choices that require continual negotiation, interpretation, and actualization. Gender is endlessly complex with a myriad of material and spatial expressions – precisely why it is a worthy and fascinating subject of historical and archaeological study.

Understanding Human Experiences Through the Materiality of Gender

What exactly *is* gender? Gender is a complex biological, social, and political dimension of human experience. Indeed, "the fundamental categories we use to understand 'human being' – like man or woman – are not ontologically given, but rather are themselves historically and culturally variable and contingent" (Stryker and Aizura 2013).

Gender is the cultural interpretation of perceived biological differences. Many cultural systems, particularly those of Western origin, construct roles and relations of women and men (i.e., gender) predicated on observable anatomical differences (i.e., biological sex). There are also often clear cultural expectations that all women and men will marry heterosexually and have children. In this rigid binary system, biological sex (female/male), cultural gender (woman/man), and heteronormative sexuality are all inextricably intertwined. Although gender *is* about sexuality and social roles, it also about embodiment and identity – as well as the ways in which human experience articulates with the political, cultural, and economic discourses of their time and location (Stryker and Aizura 2013). Therefore, a biological basis for a binary gender system belies the diversity of both the human species and the human experience.

While many Western cultures give primacy to biology and the outward appearance of genitalia, other societies use different means of assigning gender. For the Bugis in Indonesia, for example, "numerous factors go into constituting an individual's gendered identity" (Davies 2007: 19–20). Biological sex is certainly one of those factors, but so too are notions of spirituality, role in sexual relationships, the work one performs, and how one dresses – all of which "foster a system where gender multiplicity is accommodated" (Davies 2007: 29). Indeed, Bugis culture has five possible genders, including feminine females and masculine males as well as biological males who perform culturally as women (*calabai*), biological females who perform culturally as men (*calalai*), and androgynous individuals who perform spiritual functions (*bissu*). In this way, Bugis culture acknowledges a wide range of human biological and cultural variation as well as allows for a broad spectrum of gendered performance and experience.

There are other cross-cultural examples of gender systems that move beyond a binary and oppositional construct of woman-man. In Native North America, for instance, there were and are First

Nation cultures in which more than two gender categories are marked (Rifkin 2011). Other well-documented examples include the *hijras* of India (Nanda 1986) and Samoan *fa'afafine* (Munroe and Munroe 1987). In these and other cultural contexts, gender mixing represents a combination of masculine and feminine gender statuses, not a change from "one" gender into "the" other within a binary system.

Historical archaeology is a terrific tool for exploring gendered human experiences. As a discipline, it utilizes multiple lines of evidence – archaeology, architecture, oral history, folklore, and documentary records, among many other resources – to elucidate the past. It is critical to recognize, however, that archaeological practice can reinforce, homogenize, naturalize, and project onto human history models of heteronormative nuclear families (Voss 2006). Consequently, gender variation is obscured. By adopting gender as an explicit conceptual and analytical category, women, men, and other gendered beings "are brought into view as active producers, innovators, and contextualizers of the very material world by which we know the past" (Gero and Conkey 1991: 23). Importantly, gendered interpretations of human experiences are not an end in themselves, but are part of a broader project of studying "personhood" archaeologically (Wilkie 2003). Historical archaeology also studies "the ways that material practices are used to mediate the tensions between gendered difference and interdependence in social life" (Voss 2006: 123).

An individual's gender structures her or his interactions and connections to other people (including kinship and marriage) as well as access to economic resources and social power, among many other things. Gender "manifests itself in production (economics and labor) and reproduction (both physical and social)" (Jacobs 2011: 303). Therefore, gender is central to human experiences as a social force that shapes one's roles and relationships.

Gender shaped human relationships, both within the family and within the larger community as well as was reflected in the institutions of society. The dynamic social relations of gender were created, codified, and reproduced through the spatial organization of houses, the objects used in cultural rituals, and the demographic structure of the population. Furthermore, gender often facilitated or constrained access to power, status, economic resources, authority, and prestige as illustrated in the case studies that follow.

Gender in the Domestic Arena

Households correspond to a nexus of social reproduction and production in the form of practice and represent "small landscapes" for analyzing social relations (Barile and Brandon 2004). The activities within households "serve to 'produce' material things (such as food, clothing, and shelter), but they do so in a way that both reifies and transforms social structure – along with such things as gender constructions and power relations" (Barile and Brandon 2004: 8). As such, households are important units of analyses in historical archaeology and essential to understanding gendered lived experiences.

As Native American peoples adjusted to the changing economic, demographic, economic, and social circumstances of the colonial period, new gender roles were negotiated and reconfigured. For example, the Pequot in Connecticut underwent transformation through culture contact with European American settlers. Although the Pequot held reservation land, it was corruptly managed by colonial overseers (Silliman and Witt 2010). Consequently, Indigenous peoples were increasingly pushed to the literal and metaphorical edges of colonial society, existing on lands of marginal quality and engaging in subsistence agriculture and game hunting. As a result, the Pequot became inextricably bound to colonial settlers through wage labor, exchange, and indebtedness.

George Toney, for instance, moved between the reservation, where his wife Mary maintained their residence, and worked for Jonathan Wheeler, a nearby European-American farmer and merchant. On the whole, reservation lands were "largely inhabited and strongly guarded by Eastern Pequot women, who saw their male partners, children, siblings, and other relatives depart elsewhere for labor and economic resources" (Silliman and Witt 2010: 57). Importantly,

however, both men and women exchanged labor with local merchants in return for credit on food, clothing, or tools. Women often sold baskets, brooms, and other material goods in nearby towns, which took them away from the reservation and traditional spheres of interaction (Silliman and Witt 2010: 53). In addition, these objects were material representations of the displacement Pequot women, men, and families experienced and symbolic of the negotiation of the social order under colonial rule in southern New England.

The negotiation of gender roles and relations within this colonial framework found other expressions archaeologically and illustrated the complex economic networks of which Indigenous people were a part. European and locally manufactured ceramics, such as redware, replaced traditional native-produced vessels since consumer choices within this context of racism, disenfranchisement, and marginalization were significantly limited (Silliman 2009). Rather than interpret this material change as evidence of acculturation, however, Silliman (2009: 225) asserts that "when used on the reservation and in Native American community life, *these items become Eastern Pequot objects*" (emphasis in the original). Choosing to buy consumer goods that were both available and affordable "did not translate directly into the dilution of Native cultural practices, attachment to Indigenous communities, or connections to reservation land. These choices represented strategies of survival" (Silliman and Witt 2010: 62).

Whereas ceramic usage significantly changed over time in Pequot households and communities, the archaeobotanical data from reservation homelots illustrates the persistence of traditional ecological knowledge of medicinal plants from the precolonial era, an arena of expertise strongly correlated with women. These botanical practices further support the evidence that Indigenous women were central to maintaining households and sustaining the community as well as "fostering a sense of continuity and managing change" (Kasper 2012: 284). Colonial authorities, guided by patriarchal and ecclesiastical ideals of "proper" gender roles, interacted primarily with Native men. Indigenous women "were rarely acknowledged as actors in the eyes of the male colonial politicians and other observers" (Kasper 2012: 284). Consequently, gendered prescriptions were not imposed upon individual households on the reservation, and Native women remained the community's primary agriculturalists even under colonial rule. So while inequality between Native men and women increased as men participated in colonial economic activities, continuity in some aspects of Indigenous lifeways was actually facilitated by the patriarchal mind-set of colonial overseers. At least for the Pequot, traditional ecological knowledge, for example, endured despite other cultural changes under colonialism.

Interestingly too, women *and* men in both Indigenous kin groups and European-American families contributed to the domestic economy of the household and were integrated into complex webs of social and economic interaction in the colonial world of the Northeastern United States. Yet structural similarities belie significant differences in social power and access to resources, especially for women (Silliman 2009). While similar material culture may have been utilized in both Indigenous and European-American households, the meaning and cultural significance of refined earthenware vessels was by no means identical. Individuals within these households were differentially positioned to not only the material world, but the complex and interdependent arrangements of which they were a part.

The racism, disenfranchisement, and cultural persecution of the European-American colonial enterprise affected not only Indigenous peoples, but enslaved Africans as well (Fennell 2011). "Household" and "family" were not coterminous, however, as kinship was not necessarily an organizing principle around which enslaved households were structured. The conditions of slavery generally did not allow for the social configuration of nuclear families. Consequently, gendered social relations were not organized around the ideals of families seen in other colonial settings. Rather, households were social units "that worked cooperatively in production, distribution, and social reproduction activities within the domestic

context" (Mrozowski et al. 2008: 707), such as the pooling of labor and resources. Enslaved African men and women were often perceived as having different but complementary natures, which was "etched into the spatiality and temporality of daily life" (Wilkie 2003: 77). House compounds were highly gendered as men and women occupied different household spaces. Exterior areas such as yards, for example, were highly utilized by women collaborating on domestic chores, including laundry or sewing and food preparation (Battle-Baptiste 2011; Wilkie 2003). The archaeology of the domestic spaces of slavery, therefore, has yielded material culture associated with these complex households.

By examining dozens of archaeological contexts associated with enslaved Africans on plantations in the Chesapeake region of Virginia, Galle (2010) determined that men and women adopted material strategies that correlated with gender, age, and marital status. Households that consumed large quantities of metal buttons, for example, were those comprised of men who were unmarried or perhaps married to a woman on another plantation, who may have invested in stylish clothing as a display of their personalities and abilities to acquire such goods. Conversely, households with large quantities of refined ceramics were more often "kin-based households anchored by successful enslaved women who worked extraordinarily hard to achieve and maintain an economic position that allowed them to move outside the bounds of their owner's provisioning system" (Galle 2010: 37). Households with neither buttons nor ceramics appeared to represent individuals who are unable to participate in the market economy, such as women and children separated from husbands or large households for whom all resources were required for survival. Objects of personal adornment, such as buttons, therefore, were excellent material expressions of gender, age, ethnicity, and life cycle in these domestic arrangements.

By the late nineteenth century, consumption of material goods was linked to the emergence of an industrial democracy as well as the spread and significant intensification of mass production, which made conspicuous consumption possible for a larger segment of the socioeconomic spectrum (Mullins 2011). Rather than representing simply an ideological shift, the material conditions of the working class were also transformed through shorter work days, more leisure time, higher pay, and the extension of credit – all of which facilitated increased consumption by working-class laborers and challenged social ideals of class status. This rising consumerism was rooted in white racial privilege. The material disparities of America's consumer culture "were minimized, ignored, and legitimized by pervasive discourses on affluence that trumpeted the accessibility of consumer goods, hyperbolized consumer culture's ever-expanding capacity to provide goods and services, and brazenly heralded the civil and moral benefits of prosaic commodities" (Mullins 2011: 39). Consequently, consumption by the marginalized – women, people of color, and working-class individuals and families – may have been a form of empowerment and a means for actively participating in the larger cultural milieu.

The domestic and work lives of free African-Americans at the W.E.B. DuBois site in Great Barrington, Massachusetts, for instance, were very different from those of the Anglo-European families in nearby Deerfield, where the cult of domesticity was the dominant ideology structuring gendered social relations (Battle-Baptiste 2011). The ideals of a "woman's place in the home" was problematic, since the legacy of enslavement had largely limited women's labor to domestic and institutional service or arduous manual labor outside of their homes. In addition, "the inability of captive African men to actively pursue their patriarchal destiny was controlled in very dehumanizing ways by plantation owners and overseers" (Battle-Baptiste 2011: 40–41). Therefore, cultural constructions of Black womanhood and motherhood were not simply in opposition to European-American models of domesticity, but rather occurred at the multifaceted intersection of domestic ideals, post-emancipation oppression, emerging class distinctions within African-American communities, and other social, political, economic, and ideological forces of the time.

W.E.B. DuBois, the African-American writer and civil rights activist, spent his boyhood in Great Barrington embedded in the significant maternal kinship of the Burghardts. Through property ownership and other economic transactions, the Burghardt women – his mother, maternal grandmother, and other maternal kin – wielded uncommon power for the time and created a *homeplace* as the sphere of their interactions with family and community, the labor they undertook to support themselves, and the goods they purchased for consumption (Battle-Baptiste 2011: 158). Although the archaeological record yielded fragments of dishes, clothing, agricultural implements, and other vestiges of daily life, it is the land and house – "sturdy, small, and old fashioned" (Battle-Baptiste 2011: 139) – that were the most significant artifacts from this site. Landownership refuted the myth of the inferiority of the African-American family. While the men were selling their labor to more distant markets, the Burghardt women were creating their own unique position in a changing economic world. In a myriad of ways, the Burghardt women were at the epicenter of navigating the complex social worlds in which they lived and the forging of identities for themselves, their children, and their grandchildren in the post-emancipation period. Their homeplace elucidated the ways in which domesticity was significantly shaped at the intersection of race, ethnicity, and class.

The domestic residence of another freed African-American family associated with Van Winkle's Mill in northwest Arkansas provides an additional glimpse into the ways in which toys in particular highlight Victorian ideologies and social relations of class, ethnicity, race, and gender (Brandon 2013). A variety of children's items were recovered, including doll parts and marbles. These artifacts in postbellum contexts may be "seen as a mark of upward mobility and increased humanization through the consumption of increasingly frivolous goods" (Brandon 2013: 44). Parents may have purchased dolls for their daughters, for example, as a way of expressing these aspirations for ascendant social status.

Most poignant from Van Winkle's Mill, however, were the fragments of children's plates with the alphabet encircling the rim. These were typical vessels for children in middle-class homes and meant to aid in teaching the ABCs. Literacy was discouraged among enslaved Africans, and, following emancipation, education was stressed as a path to equality (Brandon 2013). As with the W.E.B. DuBois site, mainstream Victorian ideals of domesticity within white, middle-class families were not implemented in the same ways in free African-American households. Alphabet plates were used in Victorian America to signal particular class and gender ideals. For freed slaves Aaron Anderson and Jane Van Winkle, these children's plates were used to "imagine new social possibilities, mediate lived contradictions, and envision new personal pleasures, posing new relationships between consumers and society and portraying who we wish to be" (Mullins 2011: 28). With the rise of industrial capitalism, additional vectors of social inequality emerged (Orser 2010: 129). Gendered social relations were profoundly influenced by an increase in differentiation socioeconomically and racially.

The gender ideologies that structured social roles within households were not confined only to that arena of cultural engagement. Community-level social interaction was also both shaped and shaped by gender ideologies as they were practiced within domestic units. The dynamic relationship between household and community profoundly affected both of these spheres of human interaction.

Beyond the Household: Gender in the Community

Gendered social relations were codified and reproduced outside the domestic sphere at the level of the community. Domestic units do not exist in isolation, but in *relation* to one another within their larger social, political, and economic contexts and elucidate the ways in which they were connected to wider cultural processes. Community-level analyses also facilitate the investigation of cultural groups that are not visible at the scale of an individual household, such as nineteenth-century Irish immigrants living in tenements in the Five Points Neighborhood of New York City (Brighton 2011). Furthermore, a

household-level view often belies the integrated and interdependent nature of households within communities, such as in utopian societies (Nickolai 2003).

The ideologies that operated within families and households – and which were visible in the material records of those domestic spaces – significantly shaped notions of "proper" gender roles, relations, behavior, dress, and other aspects of social conduct beyond the domestic arena (Rotman 2015). The foundational gendered ideals of families permeated all levels of interaction and often reproduced patriarchal authority and inequality in both domestic entities and their larger communities. Thus, the social relations enacted within homes were replicated outside of it, just as the ideals that structured social relations within communities were enacted within individual families, households, and economic units. These spheres of interaction were mutually reinforcing, transcending the physical boundaries of individual homelots.

Occasionally, however, community-level social engagement was used to *challenge,* rather than reproduce, gender roles and relations within the home. Domestic reform was one such powerful counter-narrative in historic America, particularly during the late nineteenth and early twentieth centuries. This alternative ideal sought to redefine relationships between men, women, and others as well as expand the range of culturally accepted gender roles and behaviors within society.

Domestic reformers extended women's domestic roles into community spaces – such as parks, playgrounds, children's gardens, and other urban green spaces – which were designed to "improve urban morality by bringing people into contact with the purifying influence of God's nature" (Spencer-Wood 2003: 32; Brück 2013). Significantly, these forms of community organization and the material outcomes (parks, playgrounds) illustrate that women were active social agents in their communities and not solely relegated to the domestic sphere. Normative gender roles and relations in domestic reform movements incorporated both households *and* the communities in which they were situated. As such, the gender ideals within these two realms of social interaction were mutually reinforcing as well as simultaneously challenging and expanding gender roles and relations within individual households.

Many intentional communities emerged as alternatives to mainstream nineteenth-century American society. The Shakers were a utopian society who settled in a variety of places in the Eastern United States and whose membership was derived through recruitment and conversion. Known as the United Society of Believers in Christ's Second Appearing, the group was founded by Ann Lee, a member of a dissenting Quaker sect (Savulis 2003). The group believed in a dual-gender god, which was mediated by celibacy. As such, the Shakers' way of life deliberately eschewed heteronormative gender relations that emphasized marriage, reproduction, and patriarchal authority as key features (e.g., the cult of domesticity), providing a counter-narrative to the gender roles associated with the capitalist ideology that dominated nineteenth-century social discourse.

Gender and spiritual hierarchy within Shaker communities were reinforced through behavioral regulations, architecture, and landscape design. Those spaces that were "utilized simultaneously by men and women incorporated architectural elements that reinforced gender separation such as separate doorways, hallways, stairs, and bedrooms" (Savulis 2003: 165). Specifically, the structure of the material world was organized to promote celibacy, which was the path to salvation. The highly differentiated spaces of Shaker buildings may have significantly resembled the sexually segregated places of mainstream American architecture that was designed to isolate women in kitchen ells at the back of the home and constrain their movements to the domestic sphere as much as possible. Shaker spaces reveal once again that similarities in structural forms served very different ideological purposes in practice.

Religious ideology – beliefs and behaviors – was part of a dialogue with other secular and religious objects and ideas (Nickolai 2003), particularly during the Second Great Awakening that swept through the Eastern United States in the first half of the nineteenth century. The houselot occupied by Ellen White, a main prophet of the Seventh-Day Adventists, for example, illustrated

the interesting ways in which households engage – or not – with the communities in which they were situated. Although the small rural village of Battle Creek, Michigan in which she resided in the mid-nineteenth century was well connected to global markets, the archaeological record of her home expressed the ideological separation that belied the physical proximity to her neighbors. Thus, gender ideologies, roles, and relations must be assessed at the level of both individual households and within their local communities in order to fully understand the ways in which cultural norms are negotiated, accepted, or rejected.

White and her family embraced healthful eating as a spiritual act, eschewing alcohol, coffee, tea, and tobacco and embracing vegetarianism. Consequently, the faunal remains and artifacts associated with food preparation and storage included "few or no [meat] remains or oyster shells or cans from tinned fish and meats" (Nickolai 2003: 155), an archaeological signature very different from her farming neighbors. Rather than simply an idiosyncrasy or perhaps sampling error, the material record of one household relative to its community illustrates the varied responses of different families within a single context. Therefore, it is critical to be mindful of religion as a potentially "important aspect of the social positions and relationships of past people, and an important component in the formation of some aspects of the archaeological record" (Nickolai 2003: 157).

Significantly, the study conducted by Nickolai (2003) highlights that the location of a household in a rural, urban, or other setting is only one factor to shape uses of the material world. The relative physical isolation or integration of a site cannot be utilized as an indicator of the degree of connectedness for site residents to its community context. Often, families in rather remote locations – such as the Burghardt family of Great Barrington – are intimately connected to the outside world in important social and economic ways, while other households – such as the home of Ellen White – are proximal to their physical neighbors, but very much ideologically separate. That is not to suggest that "ruralness" or "urbanness" or "suburbanness" plays no role in the formation of the archaeological records of households and communities; rather, it is imperative that the local context for each site be carefully examined and understood in order to fully elucidate nuances in social relations.

Urban contexts provide additional interesting loci for examining households and communities as well as the dynamic interactions between these two spheres of human interaction. Immigrants and emancipated slaves flooded into America's industrializing cities during the late nineteenth century. Differences in class, race, and ethnicity often resulted in significant tensions between established economic/political structures and ideologies and those of in-migrating individuals and families.

Archaeological features on Overseas Chinese sites in the San Francisco Bay region often cannot be associated with specific households. In Chinese communities, "residential arrangements were shaped by institutionalized discrimination, racial violence, labor practices, economic relations, and culturally-specific strategies" that resulted in domestic configurations very different from their non-Chinese neighbors (Voss 2008a: 42). Indeed, the archaeological unit of analysis of the "household" is not particularly applicable to these communities in which social collectivity was so important to survival. A wide range of social units were relevant to the Overseas Chinese, including the individual, family, kin network, district association, temple membership, occupational groups, and the community at large. Movements of Chinese peoples are a global phenomenon that cannot be understood in strictly local terms. Many Chinatowns were linked not only to each other but to European-American communities through business relationships, labor practices, district associations, political organizing, and kinship ties. Since most Overseas Chinese in the nineteenth century were men, the material culture from sites dating to this period reflects their behaviors, dispositions, activities, and identities.

Excavation of wood-lined rectangular pits at the Market Street Chinatown site in San Francisco illustrated that "good sanitation was a prominent concern in this densely populated community, both for the residents' own health and comfort [but also] to counter racial stereotypes that

portrayed the Chinese people as filthy and unclean" (Voss 2008a: 45). Western discourse also emasculated Asian men. Traditional Chinese garments along with the customary long braid (or queue), for example, confounded Western ideals of gender and appropriate dress and were used to perpetuate a feminized image of Chinese men. The chinoiserie tea cups and tea bowls documented in great numbers in the archaeological record of the Market Street Chinatown were perceived by Westerns as "dainty cups," and the Chinese men who used them were emasculated in particularly *racialized* ways (Williams 2008: 60). As such, the material record reflects the complex intersection of class, racism, and ethnicity with gender in these community contexts.

Examining gender roles and ideologies within communities requires a cognizance of materiality and spatiality beyond the scale of individual households. It is critical to move between these two levels of analyses for the richest interpretation of gendered human experience. Community organizations also elucidate and reinforce cultural norms and the ways in which individuals and families negotiate and context them.

Institutions and Social Relations of Gender

Institutions often functioned (and still do) as mechanisms for social reproduction and social control. Particularly in the late eighteenth and early nineteenth centuries, the Western world redefined the social and economic order, morality, sexuality, crime, and punishment. As a result, a variety of entities emerged as part of domestic reform activities. These institutions both reflected and imposed community attitudes and identities as well as structured human life in a myriad of ways (Beisaw and Gibb 2009).

As with the mutual interaction between households and communities, institutions were another dynamic multiscalar dimension of social interaction. The Presidio in San Francisco, for example, consisted of individual domestic residences, the community of colonial residents and Native Californians, *and* was a governmental institution as a military outpost on the frontier. Similarly, utopian societies, particularly those with religious foci as their structuring principles, were both communities and representative of ecclesiastical institutions. Therefore, as with households and communities, it is imperative to consider institutions within the context of the communities of which they are a part and the ways in which they amplify ideologies operating within households.

The Presidio of San Francisco was not yet officially part of the United States when it was founded by Spain during the colonization of California's coast in the late eighteenth century. The identities of occupants of the San Francisco Presidio were quickly transformed from military settlers to that of Californios, however, through several interrelated phenomena (Voss 2008b). The emergence of a ranchero culture, a system of land grants, facilitated the accumulation of enormous landholdings in the form of cattle ranches that concentrated wealth, property, and power among a relatively few military families. This in turn facilitated the exploitation of Native Californians as labor for managing large herds and converting cattle into marketable hides and tallow. Attendant with the ranchero culture was the emergence of a seigniorial society that placed an increased emphasis on relationships over individualism and created a complex web of obligations and authority that extended across the entire social order. A white or European racial identity also became increasingly important as a means of claiming social power, wealth, and privilege in nineteenth-century California. In these complex ways, Californios simultaneously forged new identities while also naturalizing their dominance over Native Californians (Voss 2008b).

This ethnogenesis (the formation of new cultural identities) was visible in changes to the landscape, architecture, ceramics, and clothing, among other artifact classes. Several interrelated trends were observable in the material record. A collective colonial identity emerged, and the once diverse society of the San Francisco Presidio became more homogeneous, particularly in terms of internal representation (Voss 2008b). In addition, there was an increasing distinction between the homogeneity of colonial society and Native Californians. This "othering" was accompanied by the rejection of colonial settlers of their own Indigenous and African ancestries. Adobe became

the preferred building material and form as the residents of the Presidio of San Francisco articulated a shared colonial identity. This architectural style materialized a very clear distinction between military settlement and the local Indigenous peoples.

Gendered social relations were at the center of daily life at this military colonial outpost (Voss 2008b). In addition, "although sexuality is sometimes treated as a trivial or private aspect of social life, the archaeology and ethnohistory of Spanish-colonial San Francisco demonstrates that sexual politics were central, rather than incidental, to the imperial project" (Voss 2008b: 200). The Quadrangle of the San Francisco Presidio was one particularly important gendered space. In the 1810s, the Quadrangle was "redesigned, eliminating private yards. Instead, the central plaza was expanded and protected by a narrow gate. The plaza became a visually protected interior space where household activities could be undertaken by the community as a whole, rather than by each family in a private yard" (Voss 2008b: 199–200). These changes to community architecture correlated with intensifying regulation of women's sexuality during the period of increased contact with Europeans and rising concerns about ethnic propriety and respectability.

The landscape surrounding the colonial outpost was also gendered and sexualized. Colonial women rarely traveled outside the securely colonized area of the Presidio. Therefore, in their absence, "the eastern inland areas were masculinized through colonial men's military expeditions and sexualized through interethnic sexual violence perpetrated by some colonial men on Native Californians" (Voss 2008b: 289). Identities, including gendered identities, at the San Francisco Presidio were shaped and negotiated at the intersection of class, ethnicity, race, and sexuality, among other social relations. Ethnogenesis at the Presidio can be traced through changes to "material and spatial practices that occurred during the shift from a pluralistic, multiracial, colonial population to one defined by its common status as colonizers and by a regional and ethnic Californio identity" (Voss 2008b: 115). In particular, gendered social relations at the Presidio of San Francisco elucidated the complexities of negotiating gender identities, roles, and relations under colonialism.

Camp Nelson in Kentucky is another military context where gender was a dynamic dimension of lived experiences. The camp was one of the largest recruitment and training centers for African-American soldiers during the Civil War (McBride 2010). Excavations of tent sites, mess houses, and barracks revealed material culture and foodways similar to European-America soldiers at other camps, affirming some degree of standardization across military. Soldiers' diets, for example, consisted of primarily beef and beans.

The archaeology of Camp Nelson also reveals that soldiers cohabitated with their wives and children even though it was against army regulations. Fragments of dolls, glass beads, a hair barrette, and women's clothing buttons from the allegedly all-male barrack sites clearly illustrate these family living arrangements. Camp leadership provided rations only to the soldiers, but food remains illustrate that the women were quite resourceful in provisioning themselves and their children in the absence of military support. Animal bones from pork, chicken, and wild game demonstrate a diverse diet acquired through trade or purchase. The archaeological record of Camp Nelson "showed the independence, ingenuity, and entrepreneurial skill of the women and certainly contradicts stereotypes of slaves' intelligence and individual initiative" (McBride 2010: 77). The archaeological record of Camp Nelson illustrates the degree to which the army was not successful in controlling the behaviors of its soldiers nor those of the families that accompanied them.

The Johnson's Island Prison in Lake Erie, Ohio, was another gendered military context from the Civil War (Bush 2009). The island was a Union-designed prisoner-of-war camp for Confederate officers and, thus, housed men only. Incarceration in the facility was marked by overcrowding as well as limited rations, clothing, and communications. Imprisonment challenged these Southern gentlemen in a variety of ways. Many of the captured officers "had never cooked their own food, mended their own clothes or cleaned their

own room, having always lived with servants, mothers, sisters, and/or wives. Even in the military, others often addressed their personal care" (Bush 2009: 164).

The privilege these European-American men had enjoyed as officers (accorded to them through both their ethnicity *and* gender) was denied them as prisoners of war. Cooking, setting the table, washing dishes, laundry, sewing, and other daily chores had to be completed by the prisoners and were features of life in this institutional context. These tasks significantly opposed Southern folk culture that emphasized "a hierarchical social structure, ascribed status, patterns of deference, and masculine codes of honor" (Bush 2009: 24). Thus, the material record of the Johnson's Island Military Prison – refined earthenwares, buttons, and needles – represented the prisoners' negotiation of gender roles within this single-gendered environment.

Military encampments and prisons are constructed with specific governmental standards of social interaction. The actual utilization of those spaces by human agents, however, often went beyond that which the institution envisioned. Reform organizations are similarly dynamic, particularly when reform ideas are contested by those they were meant to "help."

The Magdalen Society of Philadelphia (1800–1850) "reflected not only contemporary concerns about social order, it also expressed fears about environmental decay, disease, war, natural disasters, and economic fluctuations in the gendered language of religious belief" (DeCunzo 1995: 4). The female body, sexuality, and physical and moral pollution were the specific foci of the Society and its Asylum. Women's sexual activity outside of marriage was deemed immoral, yet many of these "fallen" women were supporting themselves financially through prostitution. Therefore, Magdalens "received training in spinning yarn, sewing, laundry, and other domestic skills," all of which were consistent with the gendered occupational ideals of the time and deemed essential for becoming wives of Christian men and mothers to their children (DeCunzo 1995: 126).

The setting of the Asylum, its architecture, and landscape were all designed to enclose the women in a morally pure, garden-like environment that would protect them from the evils of the city beyond its walls. Plain, functional furnishings and dress curbed one's social and economic aspirations, and the refined ceramics were decorated with patterns that conveyed moral purity and nature (such as floral hand-painted or transfer-printed decorations) (DeCunzo 1995: 62–63, 87–89).

Most of the "fallen" women who utilized the Asylum did so for their own purposes. They did not see themselves as immoral or polluted, but sought the services of the institution because "it offered a respite from cold, hunger, life in the streets, and abusive family members and associates" (DeCunzo 1995: 127). Indeed, the women who came to the Asylum often stayed for only a short time and returned to their previous lives upon leaving.

The Magdalen Reform Society illustrates the ways in which institutions were sometimes utilized as a mechanism of social control in an effort to get community members to conform to particular ecclesiastical and patriarchal ideals of gender. Regardless of the actual success of such institutions, where they occurred, these community entities were critical components of the cultural landscape of historic America and central to society's negotiation of the changing economic and social order of their times.

Mental institutions also emerged at this time as a societal mechanism for managing "deviant" behavior in the late eighteenth and nineteenth centuries. With the emergence of psychiatry as a profession, new models for "othering" emerged. Mental illness was widely thought to be the result of hereditary or immoral living (Psota 2011). Thus, mental illness was defined not so much as a medical condition as a social one in which individuals exhibited some kind of inappropriate behavior. Those considered "insane," for example, were "that group of unproductive, bothersome defectives who, though they had committed no crime, required an indefinite and involuntary program of 'treatment and confinement,' whereas the 'mentally ill' were those moderately disturbed whose *productive potential* had yet to be determined" (Psota 2011: 17; emphasis added). Conformity to social standards was expected, uniting the ideals of domesticity and

the Protestant work ethic. Women were frequently targeted for compliance with social ideals in many ways that men were not.

Under domesticity, women were responsible for their children's care and education, while fathers were the primary financial support for the family. By the 1890s, however, mothers of special needs children were told by physicians that they needed specialized, professional, institutional care, and mothers were often blamed for their children's conditions. That is, their overprotecting and spoiling of their children created many mental illnesses, such as autism (Psota 2011: 23), resulting even more pressure on Victorian mothers to produce "perfect" children. Institutions for the treatment of mental illness were constructed in the second half of the nineteenth century, such as the Agnews State Hospital near San Francisco in 1886.

Many families sought to care for ill loved ones as long as possible, and decision making was motivated by complex variables, such as the significant social stigma of mental illness and the overcrowded conditions of many mental health facilities. Otillia "Tillie" Sengstacken's mother Mary and aunt Margaritha cared for her for many years in their home in San Jose (Psota 2011). The archaeological assemblage from their residence consisted of a disproportionately high percentage of grooming and health-product bottles relative to other domestic objects (Psota 2011: 20). Medicines included those for constipation, sedation, and pain relief and clearly illustrate the efforts Tillie's family made to care for her at home.

As her mother and aunt got older, however, effectively managing intense episodes of psychosis may have become more difficult, and, in 1920, at 43 years of age Tillie was admitted to Agnews State Hospital. Unfortunately, abuse at the institution was commonplace, and, shortly after her admission, Tillie developed abscesses on her wrists, hips, and ankles, consistent with restraints (Psota 2011: 32). She developed septicemia and died a few weeks later.

What is significant about Tillie's story is the impact that mental health institutions had on the behavior of families within households, particularly women. The conflation of mental illness with social deviance and the blaming of mothers for their children's illnesses created very dynamic and particularly gendered approaches to managing the afflicted. Thus, social ideals of communities created institutions (mental hospitals) that defined deviant behaviors as illness (particularly when one was not able to fulfill one's expected role as a productive member of society) (Psota 2011). Those institutional ideals in turn shaped behaviors at all levels of society, including the choices made by families – especially mothers – regarding the care of their children and loved ones.

Educational institutions were particularly important loci for examining the codification and reproduction of gendered social relations as schools are explicitly about training its members to function within their particular cultural setting. Children acquire "their identities through formal and informal education and usually have to reconcile input from their families, neighbors, and religious and social leaders" (Lindauer 2009: 86). While the mission of all schools is to enculturate children into socially proscribed roles, some of these institutions were more pernicious than others.

Native American children who were students at the Phoenix Indian School (1891–1990) were forcibly removed from reservations and subjected to involuntary assimilation (Lindauer 2009). The curriculum of the boarding school sought to teach boys trades, such as carpentry, blacksmithing, wagon making, and tin working, while girls were instructed in housekeeping skills, sewing, cooking, and laundry. The goals of such schools were for Indians to "assimilate, acculturate, and become Anglicized; they were to speak only English, learn a trade, dress as other Americans, and practice Christianity" (Lindauer 2009: 94). The instruction provided strongly reflected the highly segregated gender roles of domesticity that dominated the larger American cultural milieu, particularly during the late nineteenth and early twentieth centuries.

Pupils were stripped of all outward signs of their Indigenous identity. They were also forbidden to speak their Native language, practice their religion, or wear Indigenous clothing (Lindauer 2009). A school identity was imposed upon them through practices such as cutting of their hair and

wearing of a school uniform. The steam whistle was used to divide the day into different activities, teaching Native children the unfamiliar rigors of time discipline. Dishes and eating utensils as well as regimented meals three times a day instilled ideas of individuality, order, courtesy, and health awareness. Finally, the objects for play not only reinforced gender roles but also lessons of self-sufficiency and responsibility (Lindauer 2009: 95). Artifacts associated with these cultural practices illustrated the ideals with which students were indoctrinated.

The Phoenix Indian School and similar institutions, furthermore, taught self-reliance and individualism, concepts that were very challenging for Indigenous children who had been raised in a society where communal ownership and interdependence were stressed (Lindauer 2009: 96). Items such as toothbrushes and combs were used to teach cleanliness, germ transmission, and personal property. Few of these objects were inscribed or marked with the owner's name, suggesting that the ideas of individualism were not widely internalized in the student population.

Practicing of Indigenous religion was explicitly forbidden at the school and thus a form of resistance. Oral history and documentary evidence confirms that children would sneak off campus to perform Native ceremonies, dances, and prayers. Two clay figures – a miniature bird and a four-legged animal – were recovered archaeologically, which may have "provided a sense of security and connection to the customs and traditions of home as effigy representations or clan symbols" (Lindauer 2009: 99). These objects would have been perceived as contraband and thus confiscated by school staff.

The archaeological record of the Phoenix Indian School exemplifies that the social relations operating at the site were not always mutually supportive. The children's resistance to acculturation, furthermore, attests to the ways in which they fought to maintain traditional identities through their engagement with the material world. The differential positioning of the administration and students at the school meant that very different meanings were assigned to the objects used, such as an effigy figure being perceived as either contraband (administration) or a powerful symbol of home and community (children).

The institutions of society expressed (and still do) dominant cultural ideals, including those of gender. They were also instruments of power as they have the capacity to enforce hegemonic views and penalize those who failed to conform. On the surface, the military, reform institutions, and schools may appear to have had very different missions; however, a deep interrogation of their policies and practices reveals many common goals. Patriarchal authority and differential gender roles, for example, were codified and reproduced in all of these contexts. In addition, those ideals permeated all levels of social engagement within the contexts in which institutions were situated, transcending the boundaries between household and community.

Examining the archaeological and historical records of these various arenas through a multiplicity of lenses reveals the complexity of human experience as well as the ways in which individual agents reconcile the ideals being communicated. Dominant ideologies structure cultural discourse, and institutions are the most visible mechanism for their conveyance. Ideologies are rarely adopted wholesale, however, as individuals negotiate the cultural landscapes of which they are a part. That is, human beings engage aspects of ideologies – class, gender, and other – that are meaningful to them, reject or subvert other dimensions, and otherwise create amalgamations of those ideals and identities that are significant to them.

Summary: Engendering Gender in Historical Archaeology

The social and historical *context* for interpreting gendered social relations is critical. Historical archaeologies of gender have moved beyond "women's objects" and "men's objects" to understand how space and the material world represent the creation, codification, and negotiation of gendered roles and relations. Dialectics is an ideal tool in these analyses as it explores the *web* of social relations of which gender was a part (Ollman 1993). The interpenetration of opposites elucidates that objects, how anything functions,

and how people perceive them are largely due to their surroundings. Similarly, the abstraction of vantage point facilitates the examination of different sides of the same relation, while the dialectical relation of contradiction highlights interactions and negotiations within relations. Collectively, these tools allow for dynamic and nuanced examinations of social relations as they shaped human experiences.

Households and domestic spaces are particularly important loci of gendered social relations. The activities within households reify and transform social structure, notably gender constructions and power relations (Barile and Brandon 2004). Therefore, domestic residences as dynamic social entities are both the medium and outcome of social practices.

The gendered uses of space – as well as lived experiences – were more complex than simple dichotomies of production/reproduction, public/private, agricultural/domestic, male/female, and elite/non-elite would suggest (Gero and Conkey 1991; Wurst 2003). While these distinctions were real, they did not always produce mutually exclusive spaces (Hautaniemi and Rotman 2003). A binary view distorts social reality and belies the fact that an artifact can be an aspect of production *and* consumption, public *and* private, or male *and* female (Wurst 2003: 227) and, thus, utilized to perform or reinforce a particular gendered identity. Rejecting a rigid binary structure "allows us to conceptualize more than two genders and to see age, marital status, class, and race as key aspects of gendered social relations" (Wurst 2003: 230).

Although domestic units are critical units of analysis in historical archaeology, they do not exist in isolation. Rather, households are situated in *relation* to one another within their larger social, political, and economic contexts. Examinations of communities, therefore, elucidate the ways in which they were connected to wider cultural processes. Since gendered social relations within communities operate at a different scale than households do, so too are their archaeological, material, and spatial correlates.

Reformers also frequently used formal community institutions as mechanisms for social reproduction and social control (DeCunzo 1995). These institutions reflected and imposed community attitudes as well as structured human life in a myriad of ways (Beisaw and Gibb 2009), albeit with varied degrees of success.

The case studies presented illustrate a broad spectrum of gendered social relations through time and across space. They have highlighted the multiscalar nature of gender as it has operated in households, communities, and institutions as well as some the material and spatial correlates of gendered engagement. The metaphor of the kaleidoscope characterizes the complex and ever-changing meaning and practice of gendered social relations – including, but not limited to, competing ideologies, socioeconomic class, political agendas, race and ethnicity, sexuality, and developmental cycles – to create complex patterns of identities and relationships.

Importantly, dominant gender discourses often focused largely on white, urban, middle-class (and often Protestant) women in their peak reproductive years. Masculinity was frequently assumed, and women were thus habitually defined as "not male" (Jacobs 2011: 303). People outside the parameters of biological reproduction (i.e., children, the elderly, those who chose celibacy, gay and lesbian individuals) as well as the poor and those racialized as non-white (such as many immigrants and enslaved Africans) were also often excluded from prevailing gender ideals (Paynter 2000). Critical analyses of gender seek to examine both similarity and difference as well as its close intertwining with other vectors of social inequality (Orser 2010: 129). Historical archaeologists will continue to elucidate gendered social relations at the intersection of many social prisms (e.g., class, ethnicity, sexuality, religion) and the multiplicity of human experiences preserved in the archaeological record.

Cross-References

- ▶ Capitalism in Archaeological Theory
- ▶ Capitalism: Historical Archaeology
- ▶ Gender, Feminist, and Queer Archaeologies: A Spanish Perspective

- ▶ Gender, Feminist, and Queer Archaeologies: Australian Perspective
- ▶ Gender, Feminist, and Queer Archaeologies: European Perspective
- ▶ Gender, Feminist, and Queer Archaeologies: USA Perspective
- ▶ Households and Domesticity: Historical Archaeology
- ▶ Interculturality and Archaeology
- ▶ Social Archaeology
- ▶ Social Identity in Historical Archaeology

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Environmental Archaeological Evidence: Preservation

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Introduction

Evidence for the nature of past environments can take many forms and occur in many different situations. For archaeological timescales, such evidence is generally plant or animal material identified to some level (usually genus or species), and the environmental conditions suitable for a similar modern population are then assumed to have pertained at the time of preservation. As with any archaeological find, some form of dating or stratification is essential to provide a temporal context.

If one component of an assemblage is better preserved than another, a false picture could be built up of the past conditions. Awareness of the preservation trajectory since burial is, therefore, essential for an understanding of the material's true environmental significance. This entry is intended to summarize the characteristics of the main materials used for environmental reconstruction as well as the burial environments in which they are preserved or destroyed.

Key Issues

Types of Biological Materials

The fairly limited range of materials used by plants and animals to build their bodies makes it possible to derive a simple classification.

Polysaccharides

Cellulose, starches, and many sugars are polysaccharides, which simply mean sugar units bonded together in different ways. Most plant matter is formed of cellulose. This is a polysaccharide made up of glucose units whose linkage makes them indigestible to higher animals. Cellulose is abundant in nature and only broken down by lower organisms such as bacteria, fungi, protozoans, and amoebae (Bear 1964).

Starches, on the other hand, are easily broken down by animal digestion and would, therefore, be expected to break down quickly in the soil. However, they are preserved in some archaeological situations as a result either of physical protection within artifacts or by soil aggregates, by chemical protection, or even by simple weight of numbers (see Haslam 2004).

Many insect parts are formed of chitin which is structurally a polysaccharide, although taphonomically it is more like a protein.

Proteins

Two main protein groups, collagen and keratin, form the basis of most biological constructions. Collagen is the structural framework of bone and tooth matrix. Keratin is a fibrous protein, forming the skin, horn, hoof, hair, and nail.

Miscellaneous Biopolymers

Sporopollenin forms the outer coating of the pollen grain and is, therefore, highly significant to environmental archaeology. It is a biopolymer of very high preservation potential isolated as a residue after repeated chemical dissolution. The structure is unknown.

Lignin's structure is also poorly understood, but its function is well known. Older and stronger plant matter is often impregnated by lignin, rendering it more refractory. Lignin derivatives have even been recorded from 200-My-old silicified wood (Sigleo 1978).

Biominerals

Calcium Phosphate Calcium phosphate in different forms (typically Ca_3PO_4, with variable hydrogen, fluorine, carbonate, and/or H_2O bonded) is the mineral basis of the bone and tooth. This makes it probably the most important biomineral for environmental archaeology as these remains are found on so many sites, and the evidence that can be derived from the assemblages is so large and diverse (Davis 1987).

Calcium Carbonate Calcium carbonate ($CaCO_3$) is the main mineral component in mollusk shells, ostracods, and many foraminiferans (Brasier 1980).

Silica Silica (SiO_2), in an amorphous form, is the basis of diatoms, phytoliths, and some foraminiferans.

Combinations of Materials

It is common for whole biological structures to be formed out of more than one material, combining properties in a similar way to industrial laminates or fiberglass moldings. Most plant remains, for example, consist of cellulose fibers which provide the tensile strength, with the spaces taken up by lignin acting as a filler. The lignin is extremely resistant (see above) but would be brittle if it occurred on its own.

The majority of mineralized animal body parts consist of calcified keratin or chitin, with the organic component forming variable proportions of the final material. In many cases, it is a tiny percentage. Thus, for example, eggshell and mollusk shell protein contents are commonly 0.03% (Addadi et al. 1991), while earthworm calcium carbonate granules are 0.2% (Canti 2007). In some other materials, the percentage is higher, conferring greater flexibility. In bone, for example, the percentage of collagen is as high as 35%.

The preservation characteristics of these mixed materials have variable trajectories, with different stratigraphic situations promoting preservation of different components. In many cases, the protein content is too small to be of analytical significance. However, some systems will leave visibly different remains in different types of stratigraphy. Probably the best-known example of this phenomenon is the two-part structure of the bone, based on collagen and calcium phosphate. Under neutral and alkaline conditions, preservation is mineral rich and sometimes described as "chalky," whereas under acidic conditions, the mineral material largely disappears and the preserved protein structure is sometimes referred to as "jelly bone."

Taphonomic Factors

Kinetic Factors

Although many of the materials described above have theoretically predictable decay pathways in a defined burial environment, the reality of

assemblage preservation is often more messy and difficult to explain. A major reason for this disparity must arise from the events occurring during the latter parts of life, immediately on death, and at the time of burial. Did plant material accumulate by floating, or was it deposited in waste dumps? Were animal parts scavenged for a period at the surface or deeply buried with soft tissue still attached? The precise individual details of these factors significantly affect the later preservation morphology of some classes of environmental remains.

Some pre-burial effects are of major importance to the preservation of environmental evidence. Soft plant material will decay rapidly in moist soils, but if it is charred and buried without damage, it can be retained in archaeological stratigraphy for very long periods of time. Charred plant remains are a mainstay of environmental archaeology.

Equilibrium Factors

Once buried, and assuming a stable stratigraphy, the decay of most materials will conform more to the established trends. The burial environment may not be suitable for biological or dissolution processes due to freezing or to drying. In both situations, degradation can be held up almost indefinitely (see, e.g., Spindler 2001). However, these circumstances either are rare or tend to contain relatively few environmental remains. The large part of our knowledge of past environments comes from moist stratigraphy at temperatures between about 0° and 30° centigrade, where biological and dissolution processes can be highly effective.

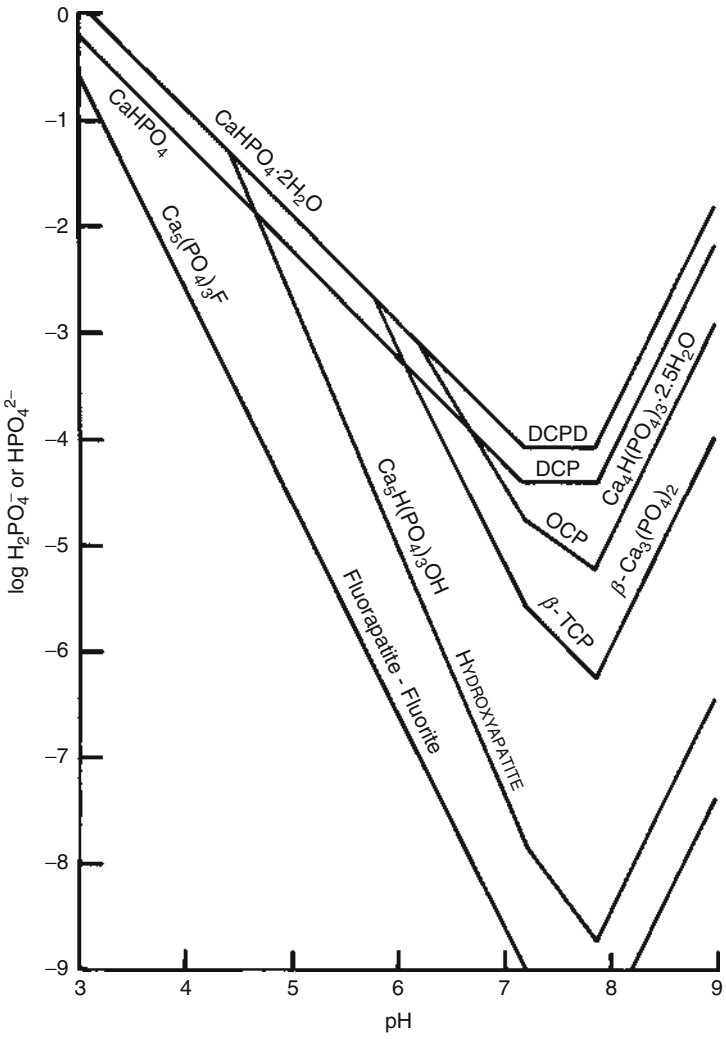
Among the mineral materials, the pH of the burial stratigraphy (which is really the pH of the interstitial water) is probably the main indicator of likely preservation in leaching environments. For calcium carbonates, the equilibrium pH is 8.4 (Rowell 1994), so dissolution will be negligible above that value but occur faster as the pH decreases. Calcium phosphates are more complex because of the different species and also the fact that their solubility increases in both the acid and alkaline directions (see Fig. 1).

Amorphous silica dissolution is pH dependent, being more soluble under alkaline than acidic conditions. However, the extent of that solubility variation across the pH range is not really significant below about pH 10 (see Fig. 2), which means that silica in most leached stratigraphy will not be affected.

The pH of stratigraphy is a bulk measure, representing a useful shorthand for the likely concentrations of common ions in the interstitial solution. It is not, however, a precise universal indicator applicable equally across the globe. The actual dissolving power of the liquid surrounding a particular material is dependent on the concentration (in solution) of the target material's component ions. Calcium is the commonest cation in temperate climate (leached) stratigraphy and the commonest soluble element of biomaterials. As a result, pH is at its most useful in these types of stratigraphy. Nearer to the equator, particularly in more arid regions, some of the more soluble ions such as sodium and potassium start to become more significant, and the pH will be influenced by these non-calcium ions.

The pH is also only one measurement within the dissolution dynamic. The rate at which the interstitial water passes over and around the target material is also highly significant. Remains constantly washed through by underground water, for example, in floodplain gravels, will be far more rapidly dissolved than if they were trapped in dense clays or deposited in topographic low points where groundwater movement is sluggish. This is due simply to the nature of dissolution. As described above, dissolution potential is governed by the concentration of the target ions in solution. If the recently dissolved ions are taken away rapidly, their concentration in the contact solution remains low; if the groundwater only moves slowly, however, a gradient of concentrations can develop around the target, such that the contact solution is almost saturated and can therefore dissolve it only slowly.

For the organic materials, dissolution is not the major destruction process. Instead, biological breakdown plays the large role, consisting essentially of the microbiological oxidation of carbon and hydrogen (in the polysaccharides, proteins, and biopolymers discussed above) to produce energy, carbon dioxide, and water. As with most biological

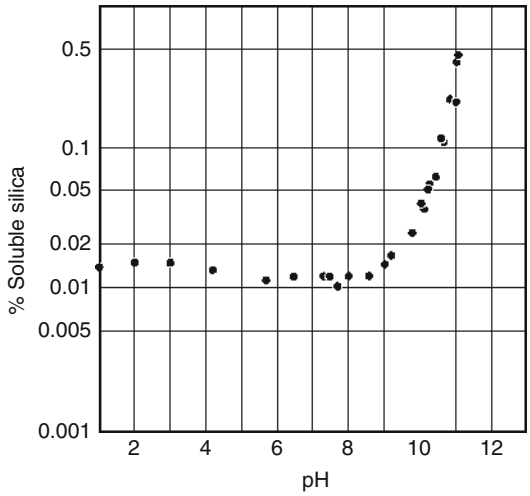


Environmental Archaeological Evidence: Preservation, Fig. 1 Solubility diagram of some calcium phosphates in soils. (Adapted from Lindsay et al. 1989 © Soil Science Society of America)

processes, this can only take place where water and oxygen are available and where the product carbon dioxide can escape to prevent a toxic buildup. At one end of the moisture scale, therefore, completely dry organic materials, although perhaps rendered brittle (and certainly rendered difficult to identify due to desiccation), do not actually break down. In the middle of the scale, moist, porous stratigraphy promotes rapid breakdown processes, and few materials can last any length of time. At the wettest end of the scale, where moisture is extreme, the requirement for good gaseous exchange is increasingly not met, and reducing conditions start to pertain (Canti 2003).

The importance of reducing conditions for preservation of organic remains in archaeology cannot be overstated. They are the basis of all the waterlogged wood discoveries such as the Swiss lake villages and the UK trackways; they are the main reason for the existence of the north European bog bodies. In these and many other examples, the associated wood remains, pollen, and plant macrofossils have provided a wealth of evidence for environmental reconstruction (Godwin 1960; Glob 1969; Coles and Orme 1986).

Reduction is often referred to as "anoxia" or "anoxic conditions." It occurs wherever oxygen can be only slowly replenished on being used up



Environmental Archaeological Evidence: Preservation, Fig. 2 Solubility diagram of amorphous silica. Based on a series of experiments dissolving silica in water buffered to different pH values for a fixed time period and then measuring the concentration. (Adapted from Alexander et al. 1954 © American Chemical Society)

by microbiological action. This could as much be in a sealed plastic bag as in the more classical situation of dense waterlogged sediments; the same process is at work, because oxygen diffuses through water about 10,000 times slower than through air. As the free oxygen moves into shorter and shorter supply, microorganisms generating methane start to become dominant, producing one of the characteristic smells of reducing conditions. Under this type of regime, the decay rate of the polysaccharides, proteins, and biopolymers is greatly lowered.

One of the best-known archaeological examples of reduction-based preservation is the South Scandinavian barrows with still-intact Early Bronze Age oak coffins maintained by reducing conditions resulting from water trapped by a thick impermeable iron pan. The coffins contained well-preserved organic remains including textiles, skin, and hair (Holst et al. 2001). A research program was instigated to understand the detail of how reduction started. The work showed that anoxic conditions rapidly built up where turf was laid over modern oak coffins containing animal bodies, which could thus be preserved for months or even years (Breuning-Madsen et al. 2001).

Reducing conditions can, however, have some unexpected detrimental side effects. If sulfate (SO_4) is present in the interstitial water, specialized bacteria will strip out the oxygen (four atoms of which are available for each sulfur atom) and use it for respiration. This leaves a sulfur atom free to bond with the hydrogen from water to make hydrogen sulfide (H_2S or rotten eggs) – another well-known smell of reduced stratigraphy. The sulfur will also form pyrite or marcasite (Fe_2S) with free iron in the stratigraphy, crystallizing in tiny spheres (framboids) made up of numerous minute individual crystals. These can encrust organic remains to the point where they become fossilized. Because seawater is sulfate rich, this pyritization process is most commonly found in estuarine or marine wetland stratigraphy (Berner 1985), but it sometimes occurs inland as well. From the preservational point of view, pyrite is less of a problem, while the conditions remain waterlogged; the real damage occurs if the site, after many years of pyrite accumulation, then becomes free draining again. On oxidation, the Fe_2S rapidly decays into a mass of free iron oxides and sulfuric acid:

$$Fe_2S + H_2O = Fe(OH)_3 + H_2SO_4.$$

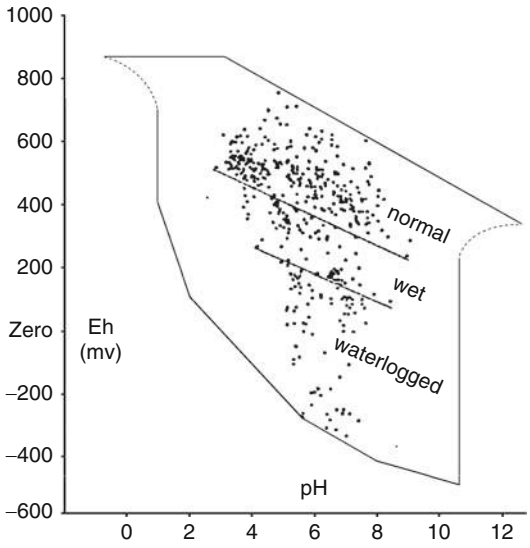
encrusting artifacts and ecofacts with red iron ochre and making it possible for the stratigraphic acidity to reach as low as pH 2, with extremely detrimental effects on many biominerals (Canti 2000; Boreham et al. 2011).

Unified Preservation Diagram

The numerous factors affecting preservation of environmental materials across different parts of the globe make a unified theory, taking in all of the variables, impossibly complex. Multidimensional graph axes would be required to draw up an all-inclusive environmental envelope. Many of the kinetic factors described above are episodic rather than scalable and can operate in nonlinear combinations that defy analysis. Furthermore, even setting kinetic factors aside, the value of an all-inclusive model is debatable. Some

environmental factors are so rare that they can be considered as one-offs, for example, the toxicity introduced by copper artifacts or the biocidal effects of salt which has produced such extraordinary preservation in the Hallstatt mines (Grömer 2005).

A generalized diagram for the most widespread preservation conditions (i.e., non-arid, nonfrozen, nontoxic stratigraphy) is, nevertheless, valuable at least as a conceptual aide-memoire, but also to provide some basis for planning programs of environmental archaeology in the commonest geochemical situations. A two-dimensional reduction vs. pH diagram was fully explored for a range of environmental conditions by Baas-Becking et al. (1960). Their method was to collate measurements made from numerous different investigations in order to set limits for the reduction (on the Eh scale, measured in millivolts) and pH fields in all natural environments, including peat bogs, freshwater sediments, marine sediments, and evaporites. Figure 3 shows their summary of world soils (which, although not a perfect match, is strongly equated with world archaeological stratigraphy).



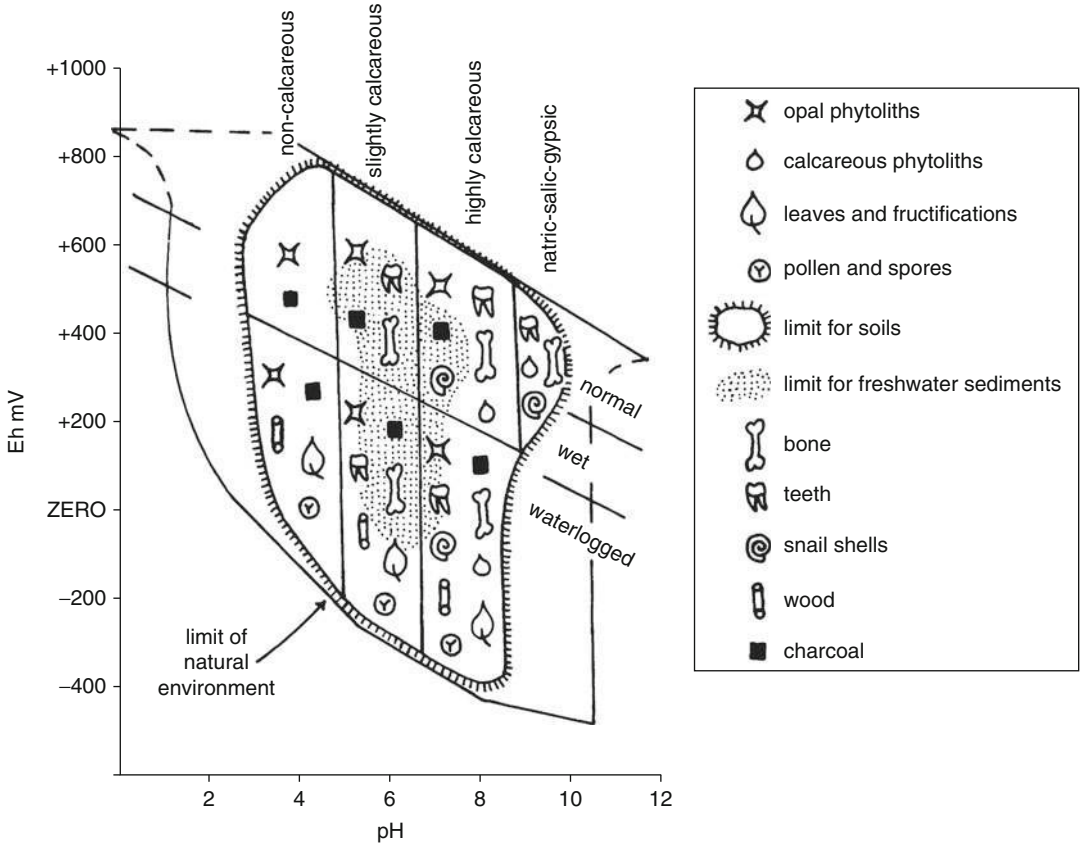
Environmental Archaeological Evidence: Preservation, Fig. 3 Measurements of Eh and pH in 414 soils from around the world. The envelope is the limits of the natural environment. (Adapted from Baas-Becking et al. 1960 © University of Chicago Press)

Baas-Becking et al.'s (1960) diagram was adapted by Retallack (1984) to produce a conceptual basis for consideration of a range of common environmental indicators. It should be emphasized that Retallack's diagram was developed for paleopedological investigations, rather than archaeological stratigraphy; the inclusion of calcareous phytoliths is not normally relevant to archaeological investigations, and the absence of insects is notable from a temperate-zone stratigraphic perspective (Fig. 4).

A further version of this diagram has been produced for UK conditions (English Heritage 2011), including insect remains as well as some less common additions, namely, parasite eggs, diatoms, ostracods, and forams (Fig. 5). It probably represents the most complete attempt to date on this type of simplification and would need little modification to be used in other moist climate situations.

Future Directions

Dissolution processes have been researched in considerable detail, so the mineralogical end of the preservation spectrum is well enough understood for all practical archaeological purposes. However, the microbiological element of preservation dynamics is still an area of some uncertainty, for example, the importance of water circulation for bacterial decay (Huisman and Klaasen 2009) and the fundamental tolerance levels of chemical parameters such as Eh, pH, H_2S, and ethylene among the fungi (Holden et al. 2006). This additional level of precision will be needed in the future for the refinement of heritage protection priorities and preservation in situ methodologies. In particular, general agricultural drainage, quarry dewatering, and water abstraction programs will have to be set against the need for preservation of environmental remains. Detailed plans for the various types of development cannot be argued through without having a complete understanding of the microbiological dynamics, even allowing for the unpredictabilities inherent in complex systems.



Environmental Archaeological Evidence: Preservation, Fig. 4 Retallack's (1984) Eh-pH stability fields for microfossils found in paleosols. (Modified from Retallack 1984 © The Palaeontological Society)

Cross-References

- ▶ Bones: Preservation and Conservation
- ▶ Charcoal: Preservation and Conservation
- ▶ Environmental Archaeology and Conservation
- ▶ Environmental Reconstruction in Archaeological Science
- ▶ Molluscs (Invertebrates): Analyses in Environmental Archaeology
- ▶ Phytolith Studies in Archaeology
- ▶ Submerged Prehistoric Landscapes
- ▶ Taphonomy in Bioarchaeology and Human Osteology
- ▶ Underwater Sites in Archaeological Conservation and Preservation

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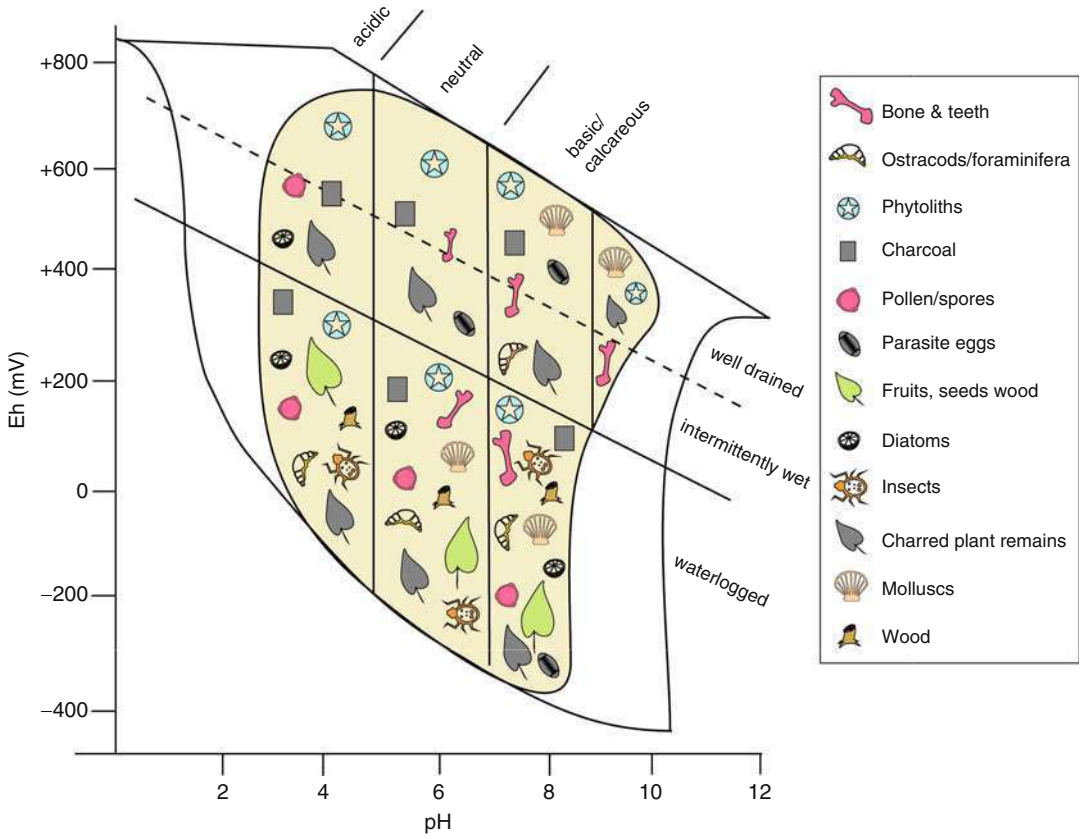

Environmental Archaeological Evidence: Preservation, Fig. 5 Modified Eh-pH stability fields for microfossils found in UK stratigraphy. (From English Heritage 2011, figure 2. © English Heritage)

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Environmental Archaeology and Conservation

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Introduction

Archaeology has an established role in heritage management, focusing on the built environment and monuments and, increasingly, on the management of archaeological landscapes, but contributions from environmental archaeology to conservation are less well established in conservation policy and practice. Growing awareness of intensified human impacts on Earth's resources and ecosystems has created increased impetus to understand the interactions between society and environmental processes in order to anticipate future system responses (Dearing et al. 2010). Many of these ecosystem responses emerge over decades and centuries, well beyond the scope of most ecological records and misconceptions about the drivers underpinning ecosystem function and conservation values can result in misguided and ineffectual management practices and policies. Historical effects are embedded in the structure, biodiversity and function of ecosystems (Foster et al. 2003). Paleoecology and environmental archaeology therefore have relevance beyond the study of past ecosystem dynamics or past human-environmental interactions: they can contribute important insights into the complex interactions between natural and anthropogenic drivers and their impacts on long-term ecosystem dynamics (Willis et al. 2010). This is essential for understanding what shapes current landscapes and conservation values and making management decisions that support the ecological processes on which we depend within a changing environment.

Definition

This entry focuses on the main contributions of environmental archaeology to the management and conservation of ecosystem processes, biodiversity, and cultural landscapes. This includes the implications of land-use legacies for current management and predicting species responses to future environmental change. The role of the past in conservation is more often associated with paleoecology than with environmental archaeology since sediment archives are often "off-site," that is, not directly associated with archaeology, and additional drivers to human agency, such as climatic and other disturbance factors (e.g., disease), are also relevant. However, understanding long-term relations between culture and conservation and between management and ecology – which form the basis for environmental archaeology – is vital for improving our ability to

manage cultural landscapes and habitats and to adapt management in response to changing climatic and anthropogenic pressures (Foster et al. 2003).

Key Issues and Current Debates

The strongest contributions of environmental archaeology to conservation are in understanding the extent to which existing ecosystems have been affected by long-term changes in human activities, establishing management baselines for restoration and management implications for maintaining cultural values, restoring ecosystem function, and supporting biodiversity and ecosystem processes.

The most common and best-established contribution from paleoecology and environmental archaeology to conservation is to provide baselines for management and restoration. Often this involves defining conditions predating significant human impact to create more "natural" ecological conditions. This is best established in the European Union Water Framework Directive, where CE 1850 has been selected as a representative baseline for managers seeking to restoring "good ecological quality" to freshwater bodies. This date marks the onset of large-scale industrialization, agricultural intensification, and atmospheric pollution which caused water acidification and deterioration in ecological and hydrological status in many catchments, as recorded in a range of proxies, including diatoms, aquatic plant macrofossils, and chironomids (e.g., Bennion and Battarbee 2007). A single reference baseline is not wholly adequate or representative, as "pre-impact" dates and conditions will vary with ecology and history, but defining a common target provides a measureable and cost-effective baseline for lake restoration that recognizes land-use legacies and allows records of past human impacts to suggest management activities that may provide conditions that allow the recovery of particular species (Froyd and Willis 2008).

Conservation planning decisions have often tended to emphasize "naturalness," as indicated in the example above. However, environmental archaeology and paleoecology reveal that many "pristine" and "ancient" habitats in tropical and temperate biomes have in fact been modified by humans over substantial time periods. Paleoecological and archaeological studies demonstrate that human impacts on "virgin" rainforest may be more extensive than has been thought, and this has significant implications for understanding ecosystem resilience and rates of recovery from human disturbance (Willis et al. 2004). These impacts can have persistent legacies: most fertile species-rich lowland rainforests in central Amazonia occur on anthropogenic "terra preta" soils which originated from agriculture and burning around 2500 years ago, for example. The high species diversity of these soils has led to increased interest in indigenous practices to reduce the rate of deforestation and find more sustainable land-use practices.

Misconceptions over the extent and role of human impacts may lead to inappropriate management being applied, particularly in cultural landscapes where biodiversity values are a legacy of historic management. Attempts to restore "natural" habitats may lead to the attrition of biodiversity by misunderstanding formative processes. Examples include policy-driven efforts to reduce the fragmentation of woodland at the expense of the more diverse landscapes created by historic nonindustrial farming in Tuscany (Agnoletti 2007) and habitat losses in high conservation value coastal habitats in NE America due to scrub invasion following a decline in the agricultural management which has largely been responsible for creating and maintaining these species-rich communities (Foster and Motzkin 2003). Increasing recognition among ecologists that current biodiversity patterns often reflect past land use more strongly than recent management may provide opportunities for greater application of environmental histories in management.

Knowledge of long-term interactions between natural variability and cultural impacts can indicate the range of appropriate management options, define an envelope of "acceptable" variability for monitoring ecological change, and test ecological assumptions (Froyd and Willis 2008). Heathland communities are often recognized as cultural landscapes, particularly in Europe, where

the dominance of grasses is considered to be an indicator of degradation. Pollen and macrofossil analyses from several English moors suggest that grass dominance is a relatively recent and unprecedented trend, but grasses were present as part of cyclical heather-grass dynamics over the last 1000 years, and heather-dominated moors are similarly uncharacteristic in the long term (Chambers et al. 1999). Grasses should therefore be considered a "natural" part of the ecosystem rather than purely an indicator of degradation, and a preference for restoring heather-dominated communities should also be tempered by knowledge that these also have no long history. By identifying the range of "normal" variability and indicating which characteristics are long-standing and which are atypical, the results provide a wider range of restoration options than often envisaged for heather moorland.

Environmental archaeology and paleoecology can make important contributions to conservation by assessing the interplay between human and natural drivers of ecological change, both of which need to be understood to predict and manage future population resilience. For instance, Hughes et al. (2008) use pollen, plant macrofossil, and geochemical data to document the decline and localized extinction over the last 2000 years of *Sphagnum austinii*, a key peat former on many raised bogs in NW Europe. By establishing critical thresholds of atmospheric nitrogen for the growth of this moss, they conclude that although it was able to reestablish itself during periods of reduced human activity in the past, contemporary levels of atmospheric pollution mean that this is unlikely to occur in the near future. Climate controlled the broad-scale dynamics of many European tree populations, but human activity has introduced considerable regional and temporal variability. For example, intensified land use over recent centuries has led to significant reductions in the abundance of oak and beech in Scandinavia and silver fir in the Carpathians. As a result, changes in current management will be needed to ensure that human activities do not override the resilience of these species to predicted future climatic shifts (Feurdean and Willis 2008; Lindbladh and Foster 2010). Environmental archaeology provides many additional examples that human activities and a preference for conserving idealized "natural" habitats in culturally shaped woodlands (Grant and Edwards 2008) are threatening the ability of many species to cope with climate change.

The history of species introductions by humans provides another example of the contribution of environmental archaeology to conservation. The introduction of alien or nonnative species poses a significant threat to conservation values and ecological resilience in many ecosystems, particularly on islands where geographical isolation over evolutionary timescales has resulted in high levels of endemism and adaptation among the indigenous flora and fauna. Paleoecological and archaeological data, including rat bones and gnawing marks on seeds, suggest that rats arriving with sailors and settlers contributed to the dramatic decline of lowland forests in Hawaii (Athens 2009), thus providing data to inform ecosystem restoration. The long duration of human influence may make it difficult for ecologists to differentiate between native and nonnative plant species. In the Galápagos, pollen and plant macrofossil evidence has identified that several plants considered "doubtful native" or introduced are actually part of the native flora (van Leeuwen et al. 2008). Such information can be used to manage nonnative species by indicating the ecological effects of long-established introductions on local ecosystems and revealing how climate and management affect susceptibility to invasion (Willis and Birks 2006). This knowledge can, however, pose additional challenges for conservation, particularly where presumed native species which are valued as part of "traditional" arable biodiversity, for example, are discovered to be "archaeophytes," that is, plants that were introduced by humans over 500 years ago.

Future Directions

Paleoecological contributions to conservation have increasingly framed long-term messages around current issues in ecology and conservation management, notably climate change, biodiversity, and resilience. The increasing emphasis in

policy and ecology on a more integrated ecosystem approach to management provides opportunities for paleoecologists and environmental archaeologists to draw on additional archival sources in order to consider socioeconomic as well as environmental dimensions of conservation. Environmental archaeology and paleoecology can provide a long-term understanding of how economic development affects the regulating services which underpin ecological resilience (Dearing et al. 2012). For instance, Hanley et al. (2008) found a negative relationship between historical livestock prices and pollen diversity from farming areas in upland Scotland over the last 400 years. This not only indicates the importance of grazing for biodiversity management but also highlights the enduring influence of economic drivers and incentives on local land manager decisions. In cultural landscapes, biodiversity and ecosystem services have been shaped by a long and complex history of settlement and land use. Environmental archaeology can make strong contributions to understanding processes and values involved in cultural ecosystem services provision. For example, the inclusion of a review of the current state of knowledge regarding the historic environment (Gearey et al. 2010) as part of the recent International Union for Conservation of Nature inquiry into the state of UK peatlands illustrates the potential for environmental archaeology to form part of an integrated approach to ecosystem management and restoration. An ecosystem service framework could allow more explicit consideration of the impacts of management on the in situ preservation of environmental and archaeological records and thus address the lack of protection afforded to many sedimentary archives.

To build on these opportunities and increase the relevance of environmental archaeology to conservation, achieving closer interdisciplinary working will remain a key goal for long-term researchers (Froyd and Willis 2008). The development of socio-ecological frameworks may aid the integration of long-term and social dimensions of environmental change with ecology and conservation management (e.g., Dearing et al. 2010). Identifying common questions that need to be addressed to improve the relevance of research to environmental management practice and policy can also improve the effectiveness of long-term contributions to conservation by engaging more with strategic and applied aspects of conservation management. This has recently become an established practice in ecology and conservation (e.g., Sutherland et al. 2011) but has yet to include long-term environmental insights.

Cross-References

- ▶ Cultural Landscapes: Conservation and Preservation
- ▶ Environmental Archaeological Evidence: Preservation
- ▶ Historical Ecology and Environmental Archaeology
- ▶ People as Agents of Environmental Change

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Environmental Archaeology in the Commercial Context

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Introduction

Environmental archaeology is the study of past human environments, using earth and life sciences to examine the archaeological record. Like many areas of archaeological science, environmental archaeology developed in the 1960s and 1970s as North American and western European archaeologists embraced ecological principles in their work, with the analysis of environmental remains now recognized as an important constituent of archaeological investigations. Environmental archaeology covers a wide range of topics often based on the subdivisions within earth and life sciences, with archaeobotanists, geoarchaeologists, osteoarchaeologists, paleoentomologists, palynologists, and zooarchaeologists all existing within the wider sphere of environmental archaeology. As commercial archaeological organizations have developed in certain countries in response to historic environment legislation, a market for environmental

archaeological work has developed, with resulting growth and expansion of the discipline, creation of new datasets, and emergence of new problems.

Definition

Environmental archaeology is a subdiscipline of archaeology, involving the study of environmental remains – for example, pollen, seeds, insects, and animal bone – recovered during archaeological excavation to elucidate a wide range of archaeological topics and themes. Like other archaeological subdisciplines, environmental archaeology has expanded and developed through the commercialization of archaeology in certain countries. This has resulted in a market for environmental archaeological analysis, in which a large proportion of environmental archaeologists are now employed.

Key Issues

Environmental archaeology, like other subdisciplines, is greatly affected by changes and trends that affect archaeology in general. One such trend has been the commercialization of archaeology in certain countries, which has occurred due to public pressure regarding the protection of archaeological heritage, resulting in government legislation. Within Europe this has essentially developed into two different approaches: a "socialist" model in which it is the central or local government's responsibility to protect and excavate threatened archaeological heritage and a "capitalist" model in which it is left to a free market to carry out excavations and heritage work (Willems and van den Dries 2007; Kristiansen 2009). The first model could be seen to operate in France and Denmark, for example, whereas the United Kingdom and the United States of America operate a free market model, although Carver (2007) has noted there are degrees of variation, with "unregulated," "regulated," and "deregulated" practices. Environmental archaeology, therefore, takes place within these larger systems of archaeological practice.

In the "free market" countries, this has led to a rise in the number of archaeological and, consequentially, the number of environmental archaeological positions. This has been well studied in the United Kingdom with the number of archaeologists rising from 1614 in 1979 to 4425 by 1998, and peaking at 6865 in 2007 (Aitchison and Edwards 2008). This corresponded with the creation of a market-driven developer-funded structure through government legislation, the Town and Country Planning Act and associated guidance, primarily Planning Policy Guidance 16 (PPG16) (Department of the Environment 1990), resulting in commercial archaeological organizations accounting for 89% of archaeological investigations between 1990 and 1999 (Darvill and Russell 2002). Although data is limited to a small number of surveys, there appears to have been a corresponding rise in the number of environmental archaeologists, for example, at least 50 commercially active zooarchaeologists were identified in a 2009 survey of the United Kingdom (Morris 2010), the majority based either within commercial organizations or as self-employed freelance specialists.

Countries with a "market-driven" commercial archaeology structure have further developed an internal market for environmental archaeological analysis, with the development of self-employed freelance specialists. Commercial organizations without an in-house specialist may therefore place work out for tender, with different specialists bidding for a specific piece of work. However, reciprocal relationships will often be formed between organizations and individual specialists. Within the United Kingdom freelance specialists are now important agents in the creation of new datasets. Morris's (2010) survey of zooarchaeologists indicates that a minimum of 506 zooarchaeological projects resulting from commercial developments were undertaken within the United Kingdom in 2009, with freelance specialists accounting for 30% of the projects and commercial in-house specialists 64%. In comparison, university-based specialists conducted only 5% of the projects.

One of the problematic factors associated with the increase in commercial environmental work is a lack of dissemination, which is an issue affecting archaeology as a whole. Within the United Kingdom reports are usually produced by commercial

units to allow their client (often a developer) to discharge a planning condition. These are unpublished and are often referred to as "grey literature." Bradley (2006) and Fulford (2011) have shown how this literature has great potential for expanding archaeological knowledge but requires synthesis. Organizations such as the Archaeology Data Service in the United Kingdom and Digital Antiquity in the United States have started to disseminate such information. However, the environmental archaeology sections in many "gray literature" reports have often been summarized with the detailed datasets only available from specific archives or the original author. In part this is a specific problem with market-driven archaeology where the emphasis is often on pricing and documentation rather than research quality and interpretation (Kristiansen 2009).

The rise in the amount of environmental archaeological work has also resulted in an emphasis on assessment rather than complete analysis. In the United Kingdom, this developed from English Heritage's guidelines "Management of Archaeological Projects 2" which was superseded by Management of Research Projects in the Historic Environment (MoRPHE) (English Heritage 2006). The principles of assessment are for an assemblage to be quickly scanned by the specialist to ascertain the potential for further work, based on the local, regional, and national significance of the assemblage. This often results in assemblages of a perceived "lower" significance not being fully analyzed or only part of an assemblage being subject to further work. The emphasis on assessment within a commercially tender-driven background could also result in poor-quality work being undertaken by inexperienced environmental archaeologists. However, this problem has been recognized by a number of quasi-governmental bodies and specialist associations. Within the United Kingdom, for example, English Heritage has released a number of guidance notes covering aspects of environmental archaeology for specialists and archaeologists who commission specialist work (English Heritage 2011), and it has also supported the setting up of working groups to support individuals within a commercial context (e.g., the Professional Zooarchaeology Group). The Association of Environmental Archaeologists, International Council of Archaeozoologists, and British Association for Biological Anthropology and Osteoarchaeology have also all published guidance notes to their members; however, there is still little or no peer review of commercial environmental archaeological reports in most countries. The development of guidance documents and procedure has resulted in a certain standardization of aspects of environmental archaeology, such as sample sizes and specialist procedures, by commercial organizations. Although this could be argued to stifle creativity within projects, it may in the long term be conducive to data synthesis.

In summary, environmental archaeology as a subdiscipline within archaeology is subjected to the same outside forces that affect archaeology as a whole. The commercialization of archaeological practices in some countries has resulted in a market for environmental archaeological work, resulting in an increase in new datasets, greater employment opportunities, and an expansion of the discipline. However, in such a situation, archaeology and environmental archaeology are not immune to general economic trends; therefore, a downturn in economic conditions in a country where archaeological work is governed by "capitalist" free market principles often results in a downturn in environmental archaeological work and a loss of positions and subsequently skills. However, countries where the state maintains control appear to be less affected (Aitchison 2009). The separation of processes within a commercial context can also make the integration of archaeological results from different material specialists harder to achieve, although this is an issue that effects all environmental archaeologists. Finally, within a free market system often based on price, standards must be considered to be an issue: organizations are working to maintain and improve standards of environmental archaeology, but in a market economy, this is also reliant on environmental archaeologists continuing to raise the profile and importance of such work to the consumer (other archaeologists and archaeological organizations).

Cross-References

- ▶ Archaeology Data Service (ADS)
- ▶ Association for Environmental Archaeology (AEA)
- ▶ Cultural Heritage Management Quality Control and Assurance
- ▶ Environmental Assessment in Cultural Heritage Management
- ▶ Standardization, Storage, and Dissemination of Environmental Archaeological Data

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Environmental Assessment in Cultural Heritage Management

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Brief Definition of the Topic

An environmental assessment (EA) is an important, though preliminary, part of the planning process for proposed developments that may directly or indirectly affect the environment. In application, the "environment" of a project area is broadly defined. It includes not only natural resources, such as plant and animal species native to the area of potential effect, but also the immediate and long-term social and economic consequences that a proposed undertaking may have upon people living in or near the development zone. Moreover, the likely impacts on any significant archaeological and historic architectural resources or cultural landscapes that might be present in the project area also will be taken into account. Consequently, an EA is a critical element in conducting responsible cultural heritage management in the public interest.

Evaluations of this kind began to be used some 40 years ago and were first formalized in the United States under the National Environmental Policy Act (NEPA) of 1969. Since that time, many nations around the globe have adopted similar laws, regulations, and governmental policies to help inform decision makers about the results, both positive (e.g., local economic stimulus or transportation system enhancement) and negative (e.g., degradation of a wetland ecosystem or destruction of a significant archaeological site), that would likely be obtained if a proposed action were to be implemented.

A formal EA report is prepared to document the study, and public input is generally solicited as part of the planning process. Such a study first identifies the perceived need for a proposed undertaking and outlines what is to be accomplished. Often several alternative approaches to

solving the perceived problem are enumerated, and for each alternative, the potential detrimental or beneficial consequences are identified. A thorough EA typically includes a so-called no-action alternative, defining the likely outcomes that would result if nothing were to be done.

Analysis usually arrives at the elimination of certain alternatives from further consideration, and frequently a preferred alternative will be identified in the report. The study may issue a Finding of No Significant Impact (FONSI) for the preferred alternative, in which case the project may proceed toward realization if that finding is upheld. The FONSI may also stipulate certain actions that parties to the proposed action have agreed to follow while implementing the project in order to ensure that environmental impacts are kept below a minimum level.

On the other hand, perhaps one EA out of ten will determine that a more detailed Environmental Impact Statement (EIS) is necessary before proceeding further with project planning. An EIS centers on location and design specifications of the viable alternative(s), and it generally requires intensive investigation of the project area by teams of subject-matter experts. Cultural resources in the Area of Potential Effect (APE) are among the many environmental elements studied in depth as part of the EIS process. Accordingly, this highly focused by-product of an EA provides the baseline inventory data and evaluations of significance that are essential to informed cultural heritage management.

It should be noted, in conclusion, that the completion of an environmental assessment does not ensure a particular outcome, such as the preservation of an important archaeological site, nor does it guarantee that all concerns about the probable effects of a proposed undertaking will be resolved before the development can proceed. Rather, the EA process aims to make certain that decision makers will be reasonably knowledgeable about the full range of environmental consequences associated with a proposed action in order to weigh the relative costs and benefits of the undertaking in question from an informed basis. Its purpose is to ensure that decision makers take into consideration cultural resources, among the many other environmental factors studied, when deciding how best to achieve a desired end. The principal objectives of cultural heritage management are thus served.

Cross-References

- ▶ Authenticity and Pastness in Cultural Heritage Management
- ▶ Canada: Cultural Heritage Management and First Nations
- ▶ Cultural Heritage and Communities
- ▶ Cultural Heritage and the Public
- ▶ Cultural Heritage Management and Native Americans
- ▶ Cultural Heritage Management: Project Management
- ▶ Heritage and Public Policy
- ▶ Heritage Areas
- ▶ Heritage Valuation: Paradigm Shifts
- ▶ Heritage, Changing Views of: A Legal Perspective
- ▶ United States: Cultural Heritage Management

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Environmental Education and Archaeology

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Introduction

A few years ago, near the dawn of the twenty-first century, the French philosopher and sociologist Edgar Morin proposed seven necessary kinds of

knowledge for the education of the future. Among them was the need to know about earth identity, e.g., knowledge of current planetary developments that will accelerate in the twenty-first century, and recognition of our earth citizenship (Morin 1999). In 1977, in the Tbilisi Declaration, which adopted by the world's first intergovernmental conference on environmental education organized by UNESCO, the role of education "in the face of environmental problems and opportunities" was recognized as "crucial" (UNESCO 1978: 12). After that, reinventing the interactive human-natural relationship – the environmental settings of human habitation together with the plant and the animal environment – is seen as an important part of a future society suited to sustainability and development. To understand this important relationship, however, we need to approach it in its historical dimension as well. Therefore, the study of the environment and the environmental change has always been one of the most important fields of archaeological research. Thus, the birth of environmental archaeology in the 1960s was a rather expected development. Today, the investigation of the ancient environment and especially of the relationship between ancient societies and their environment together with the clarification of their ecological context is at the heart of any archaeological research.

Definition

The natural environment is not only a physical landscape or a food and shelter provider. It also determines who we are, our individual national, local, and global identities. Consequently knowing and understanding it critically is substantial for our being. This is the role of environmental education, and in this role, we must look for the contribution of archaeology.

The idea of environmental education has been defined in several ways since the first systematic conjunction of education with environmental studies. A classic definition, formulated by the International Union for Conservation of Nature in 1970 describes it as ". . . the process of recognizing values and clarifying concepts to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture, and his biophysical surroundings. Environmental education also entails practice in decision-making and self-formulating of a code of behavior about issues concerning environmental quality" (IUCN 1970: 11). In the "Belgrad Charter" which was the final statement of an essential international workshop held in Belgrad, the participants adopted a framework for environmental education. They define its goal as: "To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones" (Belgrad Charter 1975: 3).

According to the late 1990 studies (Sauvé 2002: 1–4), environmental education considers the environment as:

- Nature to be appreciated, respected, and preserved
- Resource to be managed or to be shared
- A problem to be avoided or to be solved
- A system to understand for improving decision-making
- A place to live
- The biosphere in which we live, and we develop an earth consciousness
- A community project to become actively involved
- The territory of indigenous peoples in which they construct and attest their cultural identities
- The landscape which incorporates historical development and symbolic components

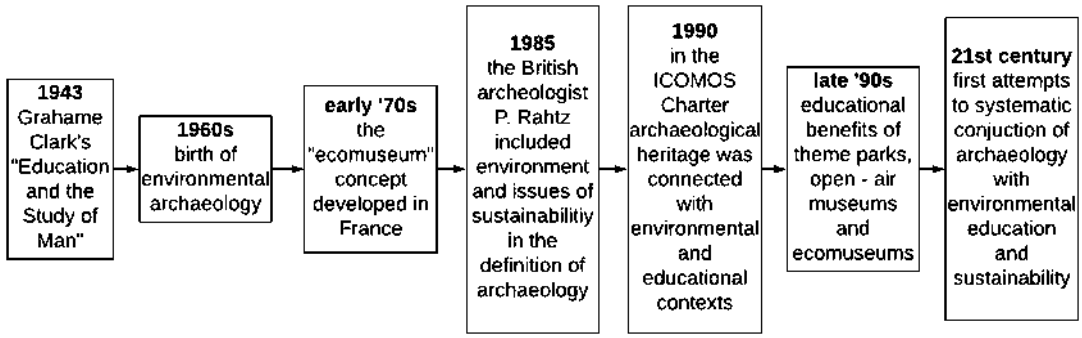
Environmental education is also linked, in the 1990s, to the concept of sustainability. This connection gives to the discipline a critical perspective for the future (UNESCO 1997). It makes it also more substantive since it takes into account the need to "combine environment and development concerns," and "for reconciliation between economic development and environmental conservation," "within a socio economic and political context" (Tilbury 1995: 197). Furthermore, the need for expanding the field through multidisciplinary frameworks enriching it from critical pedagogy's point of view of the environmental justice movement, while the principles of place-based education were expressed in the twenty-first century (Cole Gahl 2007).

On the other hand, environmental archaeology is the study of human interaction with the natural world (Renfrew and Bahn 2016). Major humanity's issues are intimately related to the modification of the environment). The domestication of plants and animals, the use of fire, field cultivation and field creation even with deliberate deforestation, the pollution of air and water, etc., are crucial aspects of the human culture history (Renfrew and Bahn 2016: 272). Besides, it is essential to understand "the role of the cognitive matrix of environmental perception and decision-making" for the relationship between culture and environment (Hassan 2006: 328). It is easy to conclude that environmental archaeology could be a handy educational tool for environmental education in general and even more so if the purpose of this education is to acquire environmental literacy. Environmental literacy "is the capacity of an individual to act successfully in daily life on a broad understanding of how people and societies relate to each other and natural systems, and how they might do so sustainably. The accomplishment of this requires sufficient awareness, knowledge, skills, and attitudes to incorporate appropriate environmental considerations into daily decisions about consumption, lifestyle, career, and civics, and to engage in individual and collective action" (Campaign 2007).

Historical Background

Archaeology's interest for the environment as the scene of human action and the provider of the means of survival begins in the nineteenth century. Today, in the context of environmental archaeology, the interactive relationship between humans and nature is an essential field of archaeological research (Reetz and Shackley 2012). A brief reference to some key points of the involvement of archaeology's interest in the environment with education is useful to understand their engagement (Fig. 1).

In 1943, during the Second World War, the prehistoric archaeologist Grahame Clark wrote an article in the 67th issue of the journal *Antiquity* under the title "Education and the Study of Man." There, for the first time, some principles, which are later found in the theory and practice of environmental education, have been put forward. He proposed, under the influence of the results of WWII war, the use of anthropology and prehistoric archaeology to make education more man-centered and oriented towards a shared future. This view is reflected from the experiences of the war and expresses the necessity of realizing the unity of the human race and its common origin through anthropological and archaeological education. G. Clark argued this way against an education that adds to the competition and the individuality of professional specialization and has the painful side effects that people experienced during the war in the early 1940s. Following the scientific facts and the archaeological theory of his time, the need for multidisciplinary interaction of various sciences and the study of man's position in nature in this context are the pillars of G. Clark's thinking.



Environmental Education and Archaeology, Fig. 1 Steps in the history of the engagement of Environmental Education with archaeology

Nevertheless, modern environmental education and the systematic interdisciplinary interest of archaeology for the ancient environment, e.g., environmental archaeology, were born almost together in the 1960s. In the early 1970s, the "ecomuseum" concept has also been developed in France. In 1985 the British archaeologist P. Rahtz included in his definition of what archaeology is the environment as one of its main concerns: "in which (environment) mankind has developed and in which man still lives," a statement that also raised issues of sustainability (Henson 2004: 28). However, the use of archaeological record as educational data was and still is, sometimes, not self-evident. Archaeologists have largely ignored environmental education, while environmental educators are, often, not equipped with a solid background in sociology or cultural history (Reetz and Quackenbush 2016: 500). In the late 1990s, for example, the educational benefits of experimental archaeology reconstructions, theme parks, open-air museums, ecomuseums, etc., in particular environment settings, worldwide, like the Butser Farm in the UK or Lake Dwellings in France, were already highlighted (Stone and Planel 1999). It is noteworthy, although, that there was not, still, any reference to environmental education.

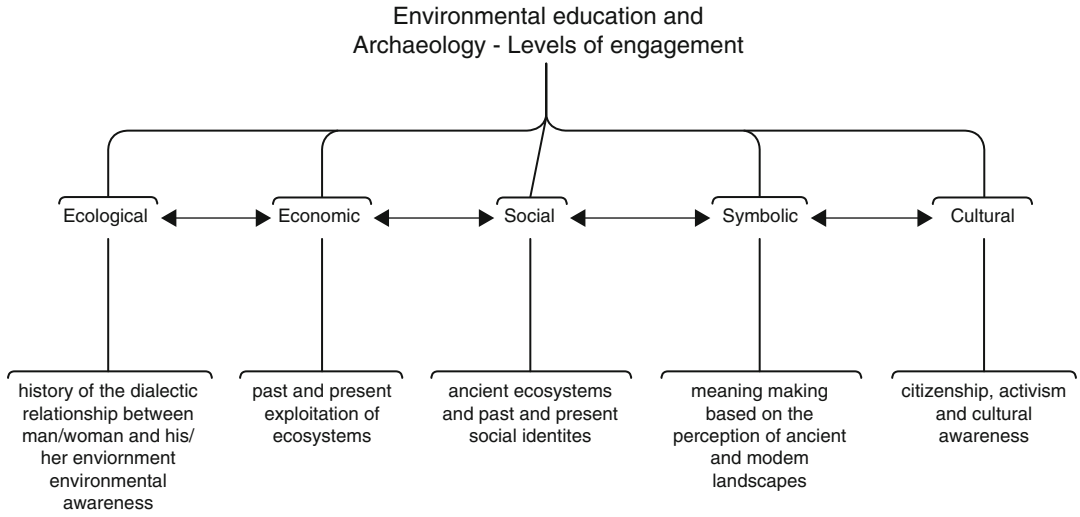
The absence of any mention to archaeology in the declarations of the international meetings concerning environmental education is also quite revealing to this direction. In the IUCN Final Report, there is not any direct reference to archaeology. It was noted that environmental education should be spread across all school subjects as a multidisciplinary science-centered subject. Furthermore, it was agreed that ecology, conservation, geography, geology, hydrology, agriculture, botany, zoology, chemistry, physics, etc., should be used as subject matter areas, while elements of mathematical reasoning should be utilized in the educational process of decision-making. Historic sites and battlefields, though, were between the selected for outdoor study sites. (IUCN 1970: 11–12, 15).

In the Belgrad Charter (1975: 4) is proclaimed that "environmental education should consider the environment in its totality" including its cultural dimension. In the Final Report of the Tbilisi Declaration, in 1977, a particular reference to the value of monuments and sites was made for the first time: "the Conference recommends to Member States that: environmental education should aim at creating awareness, behavioral attitudes and values directed towards preserving the biosphere, improving the quality of life everywhere as well as safeguarding ethical values and the cultural and natural heritage, including, holy places, historical landmarks, works of art, monuments and sites, human and natural environment, including fauna and flora and human settlements" (UNESCO 1978: 30). Finally, in the International Council on Monuments and Sites' (ICOMOS) Charter (1990) is stated, in the second Article, that "Policies for the protection of the archaeological heritage should constitute an integral component of policies relating to land use, development, and planning as well as of cultural, environmental and educational policies." Despite the increasing recognition of the importance of archaeology for education, its relationship to environmental education cannot yet be considered as a regular one. Besides, environmental education has not been of concern to archaeologists and archaeology has not been of interest to environmental educators till recently.

Key Issues/Current Debates

Environmental education is a political action in the present (Hakansson et al. 2018). It involves state and community politics, policy and social ideas, decision-making, and appropriately designed curricula with specific goals and objectives. In this context and based on the relevant international research on environmental education (Sauvé 2002; Stevenson et al. 2013) and environmental archaeology (Carman 2016; Hassan 2006; Reetz and Shackley 2012), the interconnection between environmental education and archaeological theory and data could be sought on five interdepended and interactive levels: the ecological, the economic, the social, the symbolic, and the cultural (Fig. 2).

The understanding of the dialectic relationship between man/woman and natural environment and of the historicity of this relationship is at the core of the ecological level. In this case, the study, through environmental archaeology, of how he/she exploited the land, plants, animals, and other natural resources in antiquity creating at



Environmental Education and Archaeology, Fig. 2 Engagement levels between environmental education and archaeology

the same time his/hers social landscape is of great importance. A critical aspect of this level is also the fact that ancient social landscapes are integrated today, as archaeological or historic sites, into modern landscapes. Therefore, the determination of their perception by the wider public as part of the contemporary environment is also needed. Ancient landscapes acquire added value and particular meaning in these circumstances. Statements about the need of protection and preservation of these almost sanctified landscapes are then commonplace, and they are also more readily accepted as cultural resources by the residents and the wider public.

The economic level refers to the study of how people survive in antiquity and how the humankind exploits the various ecosystems and their changes over time. It emphasizes the importance of the environment as the leading provider of natural resources in ancient civilizations also making the necessary projections about the same necessities today. It helps, finally, to realize the new exploitation possibilities of archaeological sites, which can be, due to their potential touristic value, areas of economic and sustainable development for the local communities.

The social level consists of two parameters. The determination of the form of the ancient social relations in a particular environmental setting is the first one. The second is about the way in which an ancient monument or an archaeological site as part of the modern landscape can affect and formulate the modern social environment. This landscape is part of a visible and instantly present past. It is also so familiar and so unknown to manage in the particular socio-economic and political context of modern communities. Besides, many times these communities are on the periphery, away from the administrative centers of a country where the decisions about the exploitation, the preservation, and heritage management protection of these landscapes are made. This management of monuments and archaeological sites sometimes causes local social changes considering, for example, the various possible interpretations and the touristic uses of a particular natural and cultural environment.

The symbolic level is also twofold. It concerns the determination of the ancient societies' symbolic representations based on the reception of the natural environment and the construction of collective memory. It is also related to the symbolic meaning making and the sense of place by the contemporary local communities. This meaning is created while the locals are dealing with the visible and continuously present ancient monuments and sites in their surrounding environment, and it is possible to be transformed during and after the archaeological interpretation management of this heritage.

Landscapes reflect cultural meaning. Thus, concerning the cultural level, archaeology and environmental education are related to each other not only by the general appreciation of the ancient heritage or by the knowledge about it. They are connected principally by the activism of citizens who are ready to participate in preserving and protecting the cultural environment, part of which are the archaeological sites and monuments. This activism requires the cultivation of cultural consciousness, spirit, and awareness by emphasizing the role that could be played by the local communities enhancing their activism associated with contemporary cultural and ecological problems.

As a result of this mixture of perspectives, archaeology could contribute significantly to the goals of environmental education and to creating environmental literacy. This contribution may be associated with the cultivation of the five essential components of environmental literacy – awareness, knowledge, attitudes, skills and collective action – outlined in the Campaign's Environmental Literacy Ladder (Campaign 2007). Archaeology-based thinking can undoubtedly increase awareness of the human life–natural environment relationship. It also provides knowledge about ancient ecosystems and their evolution which ensures the concern for the historic environment. It contributes to the creation and reinforcement of attitudes and values for it. Personal and collective action and civic participation, finally, are popular requests to achieve the objectives of public archaeology and cultural heritage management.

For example, archaeological sites are suitable for place-based education (Sgouros and Stirn 2016). Archaeological parks open-air museums and ecomuseums are the appropriate places for educational programs aimed both at acquaintance and understanding of the natural environment and of the anthropogenic interventions in it, while they also enhance the local communities' participation and their ecological consciousness. These activities highlight not only the historical dimension in the shaping of the environment but also develop an essential relationship of modern local societies with it fostering a sense of belonging (Reetz and Quackenbush 2016: 498–501), influencing the creation of individual social identities.

The success of environmental education concerning archaeology, however, depends also on the implementation of the appropriate learning theories, teaching methods, and processes. Some of the main pedagogical principles governing environmental educational actions (Stevenson et al. 2013) could be combined with archaeological theory and practice. Problem-solving and critical thinking are both necessary skills for the confrontation with the puzzles of archaeological inquiry and issues concerning the educational use of archaeology. Constructivism and the pursuit of critical thinking, together with experiential learning, are, for example, already applied in museum education and educational programs in archaeology. The active participation of the learners and working in groups are also prerequisites for successful educational activities and actions.

The objective of establishing environmental literacy can be integrated into the more general educational goals of teaching. It focuses on multiliteracies – e.g., on meaning making in different cultural, social, and specific domain contexts in a multimodal way – and in the pursuit of reinforcement citizenship, that is, the need to being active as a citizen confronting the different and complex, local and global, today's challenges. The use of the appropriate didactic approach is a matter of great importance. Teaching scenarios based on the principles of environmental education enriched with archaeological content and thinking, the use of the Project methodology, the learning by design and the problem-solving pedagogical methods aiming at decision-making, and producing knowledge by the students may be an appropriate learning environment (Touloumis 2008). In this context, the students work in groups and make use of all available resources including on-site, place-based study, and they discover the old knowledge and produce the new one and, finally, they make their decisions offering their responses and solutions to environmental problems. The whole approach is based on the student's groups' communication and collaboration since their groups feedback each other. The notification of the above activities results to the public is a crucial element for the success of the whole educational approach. In this way, archaeology is not limited only to the provision of the relevant to the problem knowledge, but it contributes to the awareness and the suggested solution for the under environmental discussion problem.

Summing up, archaeology can

- Introduce the content, the principles, and the methodology of environmental archaeology in environmental education
- Emphasize on the cultural heritage management dimension of the environment as well
- Help to understand the historical aspect of the human-environment relationship, its social, economic, cultural, and symbolic parameters
- Highlight the importance of environmental change for through time.

It is crucial to realize, though, that this contribution is not another way to strengthen national identities or cultural supremacy based on antiquity. Instead, it is a way to be aware of the global human fate through the study of how ancient societies exploited, shaped, and gave meaning to their physical environment, while they also care for its protection and preservation as it was their primary productive force. It is critical so to detect the sociopolitical discourses which are behind the design of environmental education programs. It is crucial to reveal the social and cultural values and the attitudes concerning the ancient and the modern environment which is encouraged by the environmental education programs in any case and to determine how archaeological theory and thinking can affect their final formulation.

International Perspectives

Although the role of archaeology in regular education is not yet well defined and much has to be done in the future in this direction, there is a strong tendency various archaeological issues to be included in environmental educational programs designed by specialists, educators, and archaeologists. The latter increasingly recognize the importance of combining archaeology with environmental education and sustainability as a means of acquainting archaeology with the public (Carman 2016; Reetz and Quackenbush 2016). The Greek case may be a good example for the whole topic. Environmental education was introduced in the Greek school system for the first time in the late 1970s (1977) as an arbitrary or voluntary action. In the 1990, it was incorporated by legal authorization in the Greek educational system (Flogaitis and Alexopoulou (1991: 341). Today it is integrated in the Greek school curricula both as a formal course in the first 4 years (ages 6–10) of primary education – in the classes textbooks titled *Environmental Study* there are separate chapters about Culture including monuments but in a sense of knowing Greece as a country or even fatherland – and as a rather optional semi-formal or informal activity mainly, in the secondary education.

Today, apart from the official bodies of the Greek Ministry of Education and its local administrators, the providers of environmental education in Greece include environmental education consultants of the Greek Ministry of Education, nongovernmental organizations, the National Association of Teachers for Environmental Education, and the management boards of natural parks. Moreover, several University departments have established graduate and postgraduate programs dedicated to environmental education. The Environmental Education Centers all over the country, where specialized staff prepares environmental educational programs in which teachers and students of different schools participate producing a strong collaborative network, are of essential importance despite the problems they face due to financial difficulties in recent years (Yanniris 2015).

Even there is not an official specific study or survey to prove it, a quick review of the existing educational, environmental programs in Greece shows that they are mainly science-oriented and that their objectives are acquiring knowledge and attitudes about the environment and environmental problems as such. Until recently, there were not many programs that involved archaeology. In recent years, however, several similar programs have been developed by the Greek Ministry of Culture, as part of its educational programs in museum settings. In schools, however, environmental projects involving archaeology are still relatively few and are being developed mainly by teachers who have studied archeology. However, the trend of producing such projects is increasing.

The implementation of larger programs such as the designed and organized since 2012 by the Greek Ministry of Culture "Green Cultural Routes," in the

context of its participation in the National Project for Education and Sustainable Development, or the European Ecological Network for the nature protection "Natura 2000" helped a lot in this direction. These projects facilitated the creation of synergies between the Environmental Education Centers, museums, Greek Ephorates of Antiquities, cultural organizations, and local cultural societies. They include activities like walks in nature, virtual art, lectures, and thematic guided tours to archaeological sites, to museums, and to landscapes of natural beauty, alongside with educational programs for school groups, families, specific audiences, people with disabilities, and other communities (Department of Education 2018).

When students are actively involved in these projects, they usually observe and concentrate data about the archaeological sites, they compare the ancient with the modern landscape, and they make their own narrations about the history of certain archaeological sites and places. Theatrical plays and other games are very often essential parts of these projects. The titles of some of the recent years respective programs which were carried out by the Greek Ephorates of Antiquities are characteristic for their goals: "Pottery: Art from soil and water," "Recognizing the flora of an ancient site," "Green trips in time: Walking at the castle," "Archaeological tours in the Ancient and Byzantine monuments," "Natural landscapes, cults and ancient cities," "Crops and seed treatment: from the past to the present," "Histories with plants. Plants with History," "The caves and their role in building the natural and cultural environment."

This kind of activities creates an interesting connection between archaeology and environmental education in Greece that could be further developed. The bond they create between the public, the archaeology, and environmental issues is an opportunity for archaeology to become more prestigious and important to the public's consciousness and to cause wider cultural and environmental awareness. To verify it, however, more surveys are needed to investigate whether this connection contributes to and enhances the apprehension of archaeology by the public or it only concerns fun and entertainment without any long-lasting impact on the uptake of archaeology's environmental dimensions.

Future Directions

According to a rather recent reference manual about environmental archaeology "environmental archaeologists are in unique positions to provide historical and global perspectives on environmental issues to the public, community leaders, conservation biologists, resource managers, and policy makers" (Reetz and Shackley 2012: 475). This declaration also indicates the remarkable prospects for the future relations of environmental education with archaeology.

Two parameters appear to be decisive for the future directions of this relationship. Firstly, it is necessary to incorporate archaeology into the academic curricula of environmental education and to reinforce at the same time the existing links between archaeology and formal environmental education in schools. Besides, it is important more professional archaeologists engage in education and particularly in environmental education. It would be worthwhile too to incorporate archaeological terminology into the vocabulary of environmental school and academic curricula. By doing this, archaeology can be fully integrated into the formal educational tools of environmental education. It will contribute so to the construction of the environmental education's "grammar" and "syntax," also taking into account the new challenges – like the use of Information and Communication Technologies (ICT), or the rapid ecological transformations, for example – faced by all academic disciplines, including archaeology, for an effective global sustainability science (Hudson 2013).

Secondly, since environmental education is increasingly linked to sustainability, it is inevitable that the contribution of archaeology to it will also be driven by this axis in the future. Despite any doubts concerning if archaeology as a discipline is amenable to sustainability – which raise the question as to whether archaeological record or process is finite or renewable as an academic discipline and a set of practices – the close connection between archaeology and heritage management, regarding, in particular, the preservation of historic sites, is a matter of significant "public value" (Carman 2016, 138–139, 145, 147). After this connection, archaeology can be linked to sustainability and develop in this direction its educational objectives and practices using the

appropriate educational tools and techniques. It could, thereby, contribute to creating the conscious and active citizen of the future as a science that studies the past without being disconnected from the present and its challenges.

Cross-References

- Adult Education in Archaeology
- Constructivism in Archaeology Education
- Environmental Archaeology and Conservation
- Formal Education up to Age 18, Archaeology in
- Heritage Values and Education
- Material Culture and Education in Archaeology
- Museum Education and Archaeology
- Narrative and Storytelling for Archaeological Education
- Public Archaeology and Education: Present Relevance to the Past
- Public Education and Archaeology: Disciplining Through Education
- Sustainability and Cultural Heritage
- World Heritage Sites and Education: UNESCO's World Heritage Education Programme

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Environmental Reconstruction in Archaeological Science

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Introduction

Environments are the totality of biological and physical variables that impinge upon an organism. Most archaeological research requires some knowledge of the environmental contexts in which humans or our ancestors made decisions, performed activities, and engaged with each other and their surrounding world. Therefore, many, if not most, archaeologists require some knowledge of past environments to address questions about past societies.

Whether driven by climate, population dynamics, disturbances, or other agents, environments are constantly changing, thereby altering organism-environment relationships. Humans and other organisms may alter properties of their environments through their decisions, movements, consumption, and other behaviors. Such alterations can have long-term evolutionary legacies (Odling-Smee et al. 2003). To disentangle these relationships and understand their consequences, archaeologists must take advantage of environmental reconstructions.

Definition

Archaeologists cannot directly observe past environments. Rather, they must reconstruct properties of past environments on the basis of indirect evidence or proxy data. *Environmental reconstruction* is the process through which archaeologists assemble relevant evidence from biological, geological, historical, or archaeological sources to infer properties of past environments. These reconstructions can be qualitative or quantitative and are constructed from archaeological and non-archaeological records. Reconstructions often emphasize properties of the local or regional biological communities but may also focus on inferring properties of past climates.

There are diverse strategies for reconstructing paleoenvironments in archaeological research. Projects might include environmental archaeologists or paleoenvironmental specialists as part of the research team or utilize a wealth of paleoecological reconstructions that have been produced by other scientists. For example, publicly available paleoclimate datasets can be accessed through the National Oceanic and Atmospheric Administration's Climate Data Center (http://www.ncdc.noaa.gov/paleo/paleo.html). Within the NOAA web portal, climate reconstructions as well as databases for charcoal, pollen, speleothems, and other proxy records are available. Regardless of the particular research strategy, all interpretations of past environmental data rely on the strength of stratigraphic and chronological control over the contexts from which the material has been collected and on uniformitarian assumptions that provide environmental meaning for biogeophysical data.

Biological Sources of Environmental Information

Biological proxy data used to reconstruct past environments broadly conforms to one of three types: (1) indicator taxa, (2) assemblage analysis, and (3) biophysical responses. Indicator taxa are used

to reconstruct particular environmental properties – usually microclimatic properties – on the basis of the presence or absence of particular taxon that has a narrow range of suitable habitat conditions. Insect remains (e.g., *Coleoptera* or beetle remains) have proven extremely useful in reconstructing rapid, microclimate changes (Lowe and Walker 1997; Egan and Howell 2001). In other cases, indicator taxa may be used to identify the timing of human impacts, particularly in island environments (Redman 1999), based on the presence of translocated species.

Plant, animal, and palynomorph assemblages are used qualitatively to identify particular ecological communities by comparison to modern analogs. Paleoecological assemblage analysis can be used to reconstruct the structure and composition of biotic communities, or it can be used for climatic inferences. For example, the movement of biotic communities identified in pollen assemblages is a proxy for climatic shifts by using their modern climatic tolerances as a basis for analogy. Quantitative reconstructions convert the proportions of taxa represented in the paleoecological assemblage to proportions of those taxa within the ancient environment. The taphonomy of these assemblages means that this process is never straightforward (see section "Key Issues" below). However, when one can control for taphonomic processes, quantitative algorithms or *transfer functions* convert quantitative paleoecological assemblage data for quantitative paleoenvironmental reconstructions.

In addition to looking at the presence or absence of a particular taxon, or the proportions of associated taxa in an assemblage, paleoecologists also measure the biophysical responses of individual organisms. Perhaps the best-known technique for analyzing biophysical responses in environmental reconstruction is dendrochronology – the study of precisely dated annual growth structures in woody plants (Speer 2010). The principle behind biophysical response analysis is that organism growth is affected by the most limiting factor in the environment. For example, in semiarid environments, moisture is the key growth-limiting factor. Therefore, patterns of standardized ring widths from trees growing in such environments can be used to quantitatively reconstruct past moisture patterns.

Geological Sources of Environmental Information

Sediments and soils are geological archives from which biological proxies may be collected, but they also serve as proxy records themselves. Geological proxy data are derived from the stratigraphy, morphology, mineralogy, and chemistry of landforms, soils, and sediments. Soils are the dynamic products of physical, chemical, and biological processes that alter sediments at and near the surface of the earth (Holliday 2004). Distinctive features of soils are reflective of the environments under which they formed. Specifically, soils are a product of the (1) climate, (2) biota that live in and on them, (3) topography, (4) the bedrock or sediment that is the parent material for soil formation, and (5) the time over which the other factors have been allowed to operate. These processes are not static. As a result, soils are often *palimpsests* of the processes that have acted upon them during the course of their formation.

Soils that retain properties from ancient but no longer active soil-forming factors are *paleosols*. Paleosols may be *buried soils* if they are no longer a part of active soil-forming processes due to subsequent burial. They may also be *relict soils* if they have been exhumed by subsequent erosion or were never buried. Properties of paleoenvironments may be inferred from soil chemistry (e.g., macronutrients, isotope composition), mineralogy, (macro-) morphology, and micromorphology (Holliday 2004; Goldberg and Macphail 2006).

In addition to serving as contexts for the accumulation of biological materials (see above) and as parent materials upon which soils may form, sediments may also be used to generate environmental proxy data. For example, the thickness of rhythmic variations in lake deposits (i.e., *varves*) can be used as a proxy for winter precipitation in some environments (Lowe and Walker 1997). Chemical sediments are minerals that are formed when ions precipitate out of solution. Chemical sedimentary proxies include evaporite minerals in paleolakes, laminated carbonates in speleothems, and biogenic carbonates in corals. Speleothems have become particularly attractive for paleoclimatic reconstructions, wherein the width of laminated bands and their isotopic composition appear to record varying amounts and sources of precipitation. Some

speleothems may preserve annual or quasi-annual banding and can often be dated directly using the uranium decay series (Lowe and Walker 1997).

Geomorphology, the study of landforms and their origin, is one of the oldest approaches to reconstructing past environments. Certain landforms only develop as a consequence of particular sedimentary processes that occur under certain climatic conditions (e.g., moraines will only form along the margins of an active glacier). Anachronistic landforms indicate paleoenvironmental conditions that contrast with contemporary ones. Stratigraphic relationships between landforms also preserve evidence of environmental changes and their relative chronology (Goldberg and Macphail 2006).

Historical Sources of Environmental Information

Historical records are a valuable source of paleoenvironmental information for certain times and certain places. Like other records, historical documents are subject to varying forms of bias in their formation. Unlike biological, geological, and archaeological biases, which are taphonomic (see section "Key Issues" below), biases in historical documents originate with the author of the documents. Recorder reliability, motivation, and conflicts of interest must always be taken into consideration when interpreting historical documents. However, historical observations can yield invaluable clues to the structure and composition of past environments (Russell 1997). Seemingly mundane, economic observations of planting and harvesting dates, for example, have been used to reconstruct paleotemperature changes (Egan and Howell 2001). Visual depictions of past landscapes and biota, which include rock art, landscape paintings, and early photographs, and ancient maps are also sources of information on past environments. Maps and written records of historical property surveys, for example, are samples of past forest composition that have been used for semiquantitative reconstructions of species changes in recent centuries (Russell 1997; Egan and Howell 2001).

Archaeological Sources of Environmental Information

Archaeological sites are archives for biological and geological proxies linked directly to human-related environmental contexts. Care is required in the use of these records because the unique formation processes of paleobiological assemblages at archaeological sites affects the relevance of archaeological proxy data for landscape reconstructions (Dincauze 2000). Archaeological deposits are particularly valuable for paleoenvironmental reconstructions because they provide opportunities for age control through archaeological cross dating. Archaeological deposits are also locations of anthropogenic sedimentation that may bury paleobiological remains that might not otherwise be preserved (Lyman and Cannon 2004).

Historical Background

By the middle of the nineteenth century, Charles Lyell and Louis Agassiz demonstrated that the Earth had great antiquity. Their writings also indicated that the Earth had experienced climates and biota that were extinct or were no longer representative of contemporary environments. Ultimately, it was the stratigraphic relationship between Paleolithic artifacts and Ice Age deposits, landforms, and biota that unequivocally demonstrated the antiquity of human cultures in Europe and North America (Meltzer 2009).

The late nineteenth and early twentieth century was a period of methodological development in the study of ancient environments. Much of this initial work was dedicated to chronology, including Gerard De Geer's pioneering varve chronology that estimated the duration of the Holocene epoch and the development of dendrochronology by A. E. Douglass (Speer 2010). The study of pollen assemblages extracted from the varves described by De Geer was used to generate the first four-part environmental subdivision of the Holocene, now known as the Blytt-Sernander periodization (Lowe and Walker 1997). Although Douglass recognized that variability in ring width was related to past climates, it was not until the 1960s that the potential of tree rings as quantitative proxies for annually resolved paleoclimate reconstructions was developed (Speer 2010).

In 1937, American anthropologist Julian Steward advocated that archaeologists understand each

culture – and culture change over time – in its ecological context. This position ultimately became influential for the generation of "new" archaeologists in the 1960s and 1970s. In the late 1940s and early 1950s, the pioneering excavations of Grahame Clark at the Mesolithic site of Star Carr contributed to the changing perspectives of Anglophone archaeologists from an emphasis on culture history and artifact taxonomy to the ecological and economic study of past societies. The Star Carr project, as well as the research of Robert Braidwood in Iraq, demonstrated the value of interdisciplinary collaborations in both fieldwork and analysis that produced environmental reconstructions at appropriate scales and resolutions for addressing human-environment research questions (Fagan 2001).

By the 1970s, quantitative analysis of pollen assemblages was being used to track the geographic patterns of dispersal and migration of plant taxa after deglaciation as well as to identify paleoenvironments that have no modern analog (Lowe and Walker 1997; Egan and Howell 2001). By this time, quantitative methods were developed to transform tree-ring width measurements and statistically calibrate them to historic climate observations to retrodict annual climate properties over multiple centuries or longer (Speer 2010). In recent decades, techniques for collecting starch grains and plant opal phytoliths from soils and sediments and the increasing accessibility of mass spectrometers have improved the range of independent proxies for environmental reconstruction. Analyses of light isotopes (carbon, nitrogen, and oxygen) from bones and shells to reconstruct paleoenvironments and paleo-diets have also become more commonplace (Dincauze 2000).

Key Issues

All environmental reconstructions rely on the interpretation of proxy records. Therefore, it is critical that all paleoenvironmental studies are conducted with explicit concern for (1) how the proxy records form or the *taphonomy* of the proxies and (2) the nature of the space-time relationships between proxies and their related environmental variables. Mismatches in spatiotemporal scale can undermine comparative analyses. Variance in the spatiotemporal scales and resolutions of archaeological and environmental records will become increasingly salient as global-, hemispheric-, and continental-scale environmental records are used by archaeologists to understand their local or regional archaeological records.

- *Taphonomy, Spatiotemporal Scale and Resolution, and Lagged Responses*

  All biophysical and geological proxies must be interpreted with an understanding of how the record formed. Some biological remains, particularly some wind-borne pollen grains, can be transported great distances before they are deposited. Others, such as microfaunal remains from archaeological contexts (Dean 2005), are unlikely to move far from where they lived. In the case of palynological analyses, the nature of the sedimentary basin has implications for the spatial scale at which the assemblage is representative. Large lakes trap airborne pollen from a larger area than small lakes (Lowe and Walker 1997). Pollen from alluvial deposits originates primarily from the alluvial watershed but may be also contain pollen reworked from older deposits and wind-borne pollen from wider areas. Pollen of some taxa travels further than others and postdepositional weathering may add further bias by differentially degrading pollen (Egan and Howell 2001).

  Similar issues are pertinent for the *temporal* scale and resolution of sedimentary proxies. Discontinuous sampling of sediments for analysis can affect the inferred timing of paleoenvironmental changes. In the case of episodic records (e.g., sedimentary charcoal records), discontinuous sampling may entirely miss key events. Additionally, the size of the sampling interval in continuous samples limits the temporal resolution of the resulting record in ways that vary based on the rate of sediment accumulation. Bioturbation and pedoturbation may homogenize materials of different ages, further reducing the precision and resolution of proxies derived from such records.

  The issue of scale and relevance is important for paleobiological records from archaeological sites, as well. Whether they represent food remains or not, small mammals are less likely to be transported long distances from their

habitat by ancient hunters than large mammals, thereby making them more reliable proxies for local paleoenvironments (Dean 2005). Cultural formation processes further complicate the interpretation of paleobiological archives from archaeological deposits (Schiffer 1996). Because of differentiation in taphonomy, scale, and resolution, care must be taken when comparing environmental reconstructions using different proxies from different contexts.

Finally, different biota will respond to paleoclimate changes at different rates, related to their mobility and lifespan. Mobile and short-lived insect populations respond much more quickly to climate changes (see the entry on "▶ Paleoentomology: Insects and Other Arthropods in Environmental Archaeology" in this encyclopedia) than long-lived and immobile tree species that must rely on seed dispersal to "migrate" to new environments (Lowe and Walker 1997). The nature of the temporal response to environmental stimuli is the *lagged response* for a particular proxy. Lagged responses affect the temporal resolution and precision of paleoecological proxies and must be considered in the course of building environmental reconstructions.

- *Human Impacts on Ancient Environments*

Beyond descriptive accounts of past environments, scientists reconstruct paleoenvironments to identify causes of environmental changes. Testing causal explanations involves chronological comparisons of hypothetical cause and response variables. Demonstrations of correlation are not sufficient to infer causation, however. It is necessary to demonstrate that (1) changes in the causal factor precede the response and (2) to specify the mechanisms by which the hypothesized causal factor would drive the observed changes. The causal mechanism should be amenable to testing with additional paleoenvironmental or archaeological data.

Human impacts on ancient environments have long been controversial, but they have never been more visible in the academic literature than they are today (Redman 1999). Scientists recognize that humans, like all organisms (Odling-Smee et al. 2003), impact their environments (Redman 1999; Dincauze 2000) and that the likelihood of ancient human impacts is high, albeit variable in space and time. This does not necessitate that all environmental changes on human timescales were caused by ancient societies, however. Attribution of anthropogenic causes to environmental degradation in the past is particularly challenging because it is often used for political purposes. In light of the far-reaching implications and visibility of some human-environment impact narratives, archaeologists should be particularly careful to be rigorous, explicit, and precise in their use of paleoenvironmental, paleoclimatic, and archaeological evidence.

The interpretive challenges and political pitfalls of human-impacts research are well illustrated by the decades-old debate concerning the mass extinctions in the Late Pleistocene. The apparent chronological correlation between the colonization of North America and Australia and the extinction of most large terrestrial fauna has been used to implicate human predation or "overkill" as the cause of the extinctions. Beyond poorly resolved chronologies (Grayson 2007), however, there is very little direct evidence to support direct predation or "overkill" as a mechanism. Alternative explanations of climate-driven or human-induced habitat changes are also plagued by poor chronological resolution and poorly supported evidence for the causal mechanisms.

A novel study by Gill et al. (2009) demonstrates the value of using multiple, independent proxies at appropriate temporal and spatial scales to identify the relationships between key processes and test alternative hypotheses of "overkill" and climate change as causes of the extinction. Gill et al. (2009) estimated megaherbivore biomass through a palynological proxy (the dung fungus *Sporormiella*), infer past vegetation communities through pollen assemblages, and use micro-charcoal as a proxy for biomass burning. By measuring each proxy from the same samples, the authors built robust estimates of the temporal associations between proxies for key response and causal variables. These records indicate that herbivore populations began declining 1,000 years before major changes

in fire activity and vegetation occurred. Therefore, climate-driven habitat change and fire-driven habitat change can be excluded as causal factors because both vegetation and fire activity postdate the decline in herbivore populations. Even with the uncertainty of the radiocarbon chronology for these cores, the relative relationship of events is securely known because of the stratigraphic relationships between the samples. In the absolute chronologies, the decline in herbivore populations precedes the archaeological evidence for local human populations, thus rejecting the "overkill hypothesis" (Meltzer 2009).

- *Scale Mismatches in Environmental Analysis*

The abundance of paleoclimatic reconstructions at the continental to hemispheric scales offers a wealth of analytical opportunities for reconstructing human-environment relationships. Careless comparisons of coarse-grained archaeological chronologies with hemispheric climate reconstructions, however, can lead to spurious conclusions. Given chronological uncertainties in archaeological datasets, one can find a reconstructed climate change that will roughly correlate with the culture change of interest. If the large-scale climatic phenomenon cannot be demonstrated to have local environmental impacts that affected the lives of human residents, however, such correlations are meaningless. For example, the Younger Dryas Chronozone was a period when many, but not all, Northern Hemisphere paleoclimate records indicate rapid cooling before the onset of the Holocene. It has been suggested that environmental changes during the Younger Dryas transformed Paleoindian cultures across North America, although given environmental variability across the continent, it is unlikely that it could have done so uniformly (Meltzer and Holliday 2010).

Mismatches in scale must be carefully considered in large-scale *meta-analyses* that combine local records into regional- or continental-scale aggregates to identify emergent properties. Such meta-analyses reduce variance between records, thus enhancing the shared signal between them, presumably because of shared causal factors acting at the same spatial scale. With few exceptions, human activities are time transgressive and variable in space. Any influence that human activities may have had on local records would likely be removed from records aggregated in this way. Although archaeological records could be similarly aggregated at a large spatial scale, mismatches in the representativeness of meta-records from archaeology and paleoecology could lead to spurious conclusions.

A recent effort to compare meta-analyses of charcoal records and radiocarbon-dated archaeological sites in the Australasian region illustrates the problems of mismatched scales and resolutions. Although both the aggregated fire history and archaeological datasets cover overlapping areas, the ecological zones represented by each dataset are not precisely the same (e.g., the western semiarid interior is well represented in the archaeological record and poorly represented in the fire record). When both datasets are aggregated, the lack of apparent correlation between the records led the authors to suggest that aboriginal Australians must have had no impact on past fires (Mooney et al. 2011). This conclusion is inconsistent with historical, ethnographic, and other paleoecological observations and is not warranted by the analytical methods because the datasets are mismatched in spatiotemporal scale. Such meta-analyses are likely to become more common in the future. Collaboration with archaeologists that includes appropriate scalar relationships between the datasets and their relevance to particular research questions will improve the quality of such endeavors.

Future Directions

Increasingly, environmental reconstructions are central components of archaeological research programs. These efforts improve our understanding of past societies, their legacies on their surroundings, and their responses to environmental changes. Environmental archaeology has an important role to play in addressing outstanding questions of human impacts on environments that have had evolutionary consequences for humans and other organisms. Recent hypotheses about the role of ancient land use affecting Holocene climates will also require archaeological testing. These are not exclusively academic endeavors.

Environmental archaeology has begun to contribute to discussions about solving modern social-environmental problems. Progress on these fronts will likely continue in the foreseeable future.

- *Human Contributions to Ancient Climate Change*

  Human agency in global warming since the industrial era is not in dispute among scientists. Paleoclimatologist William Ruddiman (2005), however, has provocatively suggested that human impacts on Earth's climate system long predate the industrial era. Ruddiman suggests (1) that deforestation for agriculture in temperate forests altered global carbon cycling beginning 8,000 years ago and (2) that the development of paddy rice agriculture increased tropical methane releases over the last 5,500 years. These greenhouse gas emissions stabilized Holocene climates and delayed the start of the next glacial period. From an atmospheric perspective, these hypotheses explain the anomalous relationships between carbon dioxide and methane concentrations in the Holocene relative to previous interglacial periods. At present, however, these hypotheses lack sufficient archaeological support. Archaeologists will play a key role in testing the Ruddiman hypotheses in the future with important implications for contemporary policy discussions regarding global warming.
- *Niche Construction and Human Biological and Cultural Evolution*

  Evolutionary biologists are increasingly turning their attention to the role of niche construction as an evolutionary process. *Niche construction* is the process by which organisms alter the selective pressures on themselves, their descendants, and other organisms in their environment (Odling-Smee et al. 2003). All organisms affect their environments, but humans are quintessential niche constructors. Explicit study of the evolutionary legacies of human behaviors and their environmental impacts is lacking, however. In the future, archaeologists and paleoenvironmental specialists will begin to untangle the role of niche construction in hominin evolutionary history.
- *Applied Research for Biodiversity Conservation or Ecological Restoration*

  Modern environments are a product of their history. Land managers and conservation biologists increasingly recognize the need to understand the history of a particular landscape to ensure its sustainability in an ever-changing world. Data about the variability in structure, composition, and key ecological processes of past environments are key to this type of management known as *applied historical ecology* (Swetnam et al. 1999). Archaeologists have been late to recognize their importance to this field but increasingly recognize that applied historical ecology needs archaeology to understand how humans contributed to past ecological structures, compositions, and dynamics (van der Leeuw and Redman 2002). Zooarchaeologists have spearheaded archaeological research that is relevant for contemporary environmental problems (Lyman and Cannon 2004), but other environmental archaeologists are poised to contribute as well. Archaeological contributions to applied historical ecology will require increased collaboration with non-archaeologists and, in most cases, will require research designs that are driven by non-anthropocentric questions and goals. This may be an uncomfortable future for archaeologists from anthropological traditions, but by emphasizing the social dimensions that are necessary to understand social-ecological sustainability, it is distinctly anthropological. Perhaps, in the future, environmental archaeology will be recognized as a cornerstone field within applied anthropology.

Cross-References

- ▶ Braidwood, Robert John
- ▶ Clark, John Grahame Douglas
- ▶ Dating Techniques in Archaeological Science
- ▶ Molluscs (Isotopes): Analyses in Environmental Archaeology
- ▶ Multiple Microfossil Extraction in Environmental Archaeology
- ▶ North American Megafauna Extinction: Climate or Overhunting?
- ▶ North American Terminal Pleistocene Extinctions: Current Views
- ▶ Paleoentomology: Insects and Other Arthropods in Environmental Archaeology

- ▶ People as Agents of Environmental Change
- ▶ Phytolith Studies in Archaeology
- ▶ Soil Pollen Analyses in Environmental Archaeology
- ▶ Star Carr: Environmental Archaeology

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Environmental Sampling in Mediterranean Archaeology

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Introduction

The Mediterranean region today possesses a large number of heterogeneous microenvironments. Hot, dry summers and wet, cool winters are common, but by no means invariable, while a high degree of variation in lithology, surface geology, and topographic relief produces fragmented vegetation zones ranging from desert to alpine, with abundant interfaces between zones. Overall, there is a pronounced altitudinal climate gradient, with upland regions often cooler and wetter. There is good reason to believe that environmental parameters had a strong influence on where ancient people chose to settle, the strategies they pursued in their management of crops and domestic animals, and the long-term success of these symbiotic human/plant/animal communities.

By definition, the process of environmental sampling involves taking samples, characterizing them according to certain parameters (size, age, species), and extrapolating from them to a larger population, in order to permit the identification of

variation on scales commensurate with archaeological data and questions, for example, the identification of wet and dry phases within the Holocene or a change in the relative representation of pine and oak pollen over the course of a site's occupation. Important variables such as temperature and rainfall may be attempted to be measured indirectly, through the use of proxy variables thought to have a predictable relationship to them. Since global climate also necessarily has an effect on local and regional environments, research into ancient environments also involves the use of world-level climate data.

Definition

Environmental sampling in the Mediterranean world encompasses a wide range of techniques for recovering and characterizing physical evidence that may yield information about the ancient environment at multiple scales, temporal and spatial. Categories of evidence routinely sampled include sediments, either derived directly from archaeological contexts or having the potential to give information about conditions in the past, and the physical remains of plants, animals, and humans. Since, as with other categories of evidence, it is impossible to recover all the material that was deposited, it is necessary to take samples that can be used to characterize the population from which they were drawn. Such sampling allows archaeologists to place ancient people's behavior and strategies in context and to understand better the complex, mutual relations between human communities and the environment. While specialties have developed independently, environmental research is increasingly collaborative, relying on multiple lines of evidence.

Historical Background

The investigation of ancient environments in the Mediterranean is nearly as old as the study of antiquity. A number of ancient authors recorded information about weather conditions, vegetation, and human interactions with the environment, for example, the presence of great forests in areas no longer wooded and summer rainfall in places which now seldom receive rain in summer. For a long time, ancient historians and archaeologists tended to accept the testimony of these ancient authors uncritically, inferring that the landscapes they observed had "deteriorated" since antiquity due to deforestation, erosion, and grazing (Grove and Rackham 2003). However, in contrast to narratives of the destruction of stable climactic vegetation regimes, erosion, and accelerated aridification, recent literature tends to characterize local environments as responsive to human action but also complex, robust, and naturally dynamic.

In the late nineteenth century, archaeologists undertaking large-scale excavations at major classical sites observed evidence of significant geomorphological changes. At the sanctuary site of Olympia in the Greek Peloponnese, buildings were found to be buried under up to 8 m of silt. This fill has traditionally been identified as alluvial deposits from the Kladeos river, though more recently it has been suggested that high-energy sediments support catastrophic flooding caused by the ingression of seawater from tsunami waves striking the coast (Vött 2011). Elsewhere, as at the Roman ports of Ostia and Portus, topographers and archaeologists found that coastlines had eroded or insilted. Occasionally, changes in sedimentary geology cast light on important historical events, such as the Battle of Thermopylae (Kraft et al. 1987). In part because the sedimentary geology of archaeological sites was important for understanding cultural sequences and historical events, the geomorphology of ancient sites and regions developed into an important area of study (for general sources see Rapp and Hill 1998, Stein and Farrand 2001).

The mid-twentieth century saw increasing interest in environmental questions in Mediterranean archaeology, particularly in the archaeology of prehistoric periods. This can be attributed to a combination of factors including the notable success of environmental research in adjacent disciplines, a host of new or newly refined scientific techniques; the growth of interdisciplinary regional projects, which focused on landscape use at the regional level, rather than sites; and, on the historical side, the influence of the Annales school, which dealt with long-term history of human/environment interactions, among other

subjects. In the Near East, research on the origins of agriculture pointed to the importance of post-Pleistocene climate change. The British School at Rome, the Minnesota Messenia project in the eastern Peloponnese of Greece, and the Department of Antiquities in Cyprus all undertook major archaeological surveys and inventories of archaeological sites, and in 1949 Fernand Braudel published his enormously influential history of the Mediterranean in the reign of Philip II, which included long sections on geography and environment as they figured in human history of the region. All of these turned scholarly attention to landscapes as dynamic and fitting subjects of study within archaeology.

In 1969, the geographer Claudio Vita-Finzi proposed that the sedimentary geology of the Holocene had been radically altered by human action in the late Holocene, in particular a "Younger Fill" laid down by erosion in the aftermath of major deforestation and land clearances. While he was not the first to propose that the Mediterranean landscape had been degraded (see Grove and Rackham 2003; Butzer 2005), his model gained widespread attention, and though few would now endorse it, it had an enduring legacy in encouraging classical archaeologists to pay attention to local geomorphological histories. Subsequent work by Paepe et al. (1980), John Bintliff (1992), and many others problematized Vita-Finzi's model and, in encouraging regional approaches to sedimentary geology, led to the production a much higher-resolution picture of stability and change in the surface geology of the circum-Mediterranean. Nearly all excavations and regional projects now devote at least some attention to local sedimentary geology.

With Willard Libby's pioneering work on radiocarbon in the late 1940s and 1950s, organic materials could be assigned absolute dates (albeit at wide ranges of error initially), a milestone as much for environmental science as for archaeology. The utility of the technique was greatly improved through the construction of calibration curves which allowed researchers to correct for different proportions of the isotopes of carbon in the atmosphere at different times in the past. Meanwhile, the principles of dendrochronology and dendroclimatology had been articulated by A.E. Douglass in the 1920s and refined by Harold Fritts in the 1950s. The science developed along with radiocarbon as dendrochronological data was used to construct calibration curves for the correction of radiocarbon determinations, with synergetic improvement in the resolution of both methods. Dendrochronology is not only a dating method with exceptionally high precision under good conditions but one of the most useful sources of evidence for environmental change in the ancient Mediterranean world. The dendrochronological record is uneven, however, both in space and time, with some regions and periods represented by hundreds of samples and others virtually undocumented. Glacial ice and foraminifera data sets are not only used to calibrate radiocarbon determinations but major sources of information in their own right regarding atmospheric conditions and therefore global temperatures in the past, against which locally derived vegetation sequences and sedimentary geology can be interpreted.

In the decades after the middle of the twentieth century, the identification of seeds and animal bones began to be considered an important category of archaeological evidence in the Mediterranean world. The identification of both botanical and faunal remains was made possible with recourse to large comparative collections assembled in the nineteenth century. The application of statistical methods, pioneered in the Near East by investigators working on animal management and domestication, made the study of faunal remains a far more rigorous and informative discipline. Age/sex mortality curves allowed faunal specialists to adduce hunting and herd management strategies (Payne 1973), and the general approach of using taphonomy to track human relationships with animal populations has been more widely generalized. Fluctuation in average body size, proportional representation of game species, or treatment can be observed and examined as possible indicators of environmental stress or abundance.

Turning to paleobotany, an equally important development came with experiments in water sieving. Early pioneers of the technique in the late 1960s and early 1970s included Kent Flannery, George Willcox, and Gordon Hillman, all of whom were concerned with the origins of

agriculture. As flotation came to be applied more widely, it quickly developed from a procedure that could be performed by "an illiterate with a bucket" (Flannery 2009 (1976)) to a sophisticated technique for the separation of light and heavy fractions of the micro-archaeological record from the sedimentary matrix.

Despite issues of selective deposition, preservation, paleobotany remains a critical and underutilized source of information. Especially where large volumes of excavated sediments are tested, paleobotany can interface with faunal data to provide a remarkably detailed picture of ancient environments, human strategies, and lifeways and their change over time.

Palynology, the study of preserved airborne spores and particles (not only pollen), was initially developed in Scandinavia and Northern Europe, where lake sediments preserved long records of stratified arboreal pollen, permitting the identification of changes in the relative abundance of different species. Pioneering work by Gunnar Erdtman in the early to mid-twentieth century led to the wider application of the science and refinement of its methods; radiometric dating permitted pollen cores more readily to be placed within an absolute chronological framework and compared with other sources of evidence. In the Mediterranean region, lacustrine deposits have provided critical information about regional vegetation histories in the Quaternary (Bottema et al. 1990; Jalut et al. 2009). It is also possible to recover pollen from dry and non-lacustrine sediments, including archaeological deposits. One of the most important challenges workers face in the interpretation of pollen data is to come to an assessment of how well the recovered sample reflects the plant population that produced it. Since not all kinds of vegetation and not all areas in the vicinity of the sampled site will be equally well represented, it is desirable to model pollen transport. While care is required in their use, long pollen sequences documenting local vegetation change are particularly important sources of environmental information.

Anthracology, the specialist study of wood charcoal, involves the identification of different woody taxa preserved by burning. In archaeological contexts, charcoal does not usually represent a random sample of trees existing in the environment, but rather reflects human choices and action at every stage from collection of wood to deposition of charcoal. That said, it is highly informative about people's use of available resources, especially where it can be compared against other sources of environmental information.

The above are by no means the only available sources of information about ancient Mediterranean paleoenvironment, and the development and application of a wider range of environmental studies can be expected to expand the tool kit still further. The use of geographic information systems and computer modeling deserves mention, however brief, as increasingly indispensable technologies that have enhanced the management, analysis, and presentation of data. Meanwhile, new sources of environmental information continue to be developed. For example, phytoliths, distinctive silicaceous, or other residues produced in plant tissue, and which survive the death and decay of the plant (Piperno 2006), are as yet understudied in Mediterranean archaeological contexts but have the potential to make significant contributions to the reconstruction of ancient environments (Tsartsidou et al. 2007).

Key Issues and Current Debates

Current work on environmental sampling in Mediterranean archaeology includes not only the continued application of all the techniques reviewed above in collaborative archaeological and environmental research but attempts at large-scale synthesis and comparison. Two key questions for every researcher and end user of environmental data are how well samples reflect the populations from which they were drawn and how far the results are to be extrapolated in space and time. Different categories of evidence reflect processes at different scales, from global (e.g., climate change) to regional (e.g., geomorphological changes related to widespread erosion), to site level (e.g., agricultural intensification), and to household level (increased storage), and these are not always

easily distinguished. In a landmark paper now more than a decade old, Robinson et al. (2006) concluded that different lines of proxy evidence for paleoclimate in the Eastern Mediterranean including Dead Sea levels and pollen cores generally agreed with evidence from Northern Europe on the timing of major changes in paleoclimate. Similarly, Jalut et al. (2009) argue that local vegetation changes throughout the circum-Mediterranean and over the course of the Holocene can be shown to reflect global climate. They distinguish three phases: the lower Holocene (11,500–7000 BP), a long wet phase interrupted by several arid intervals, followed by an intermediate phase in which changes in global atmospheric circulation assumed new importance, succeeded by a phase (5500 BP–present) characterized by increasing aridification (Jalut et al. 2009). Such large-scale changes had different effects in different regions, however. Present-day Mediterranean landscapes can exhibit marked variation in such variables as the quantity and timing of rainfall, both from year to year and from place to place. Since seasonality and risk of harvest failure or resource shortage in bad years are likely to have been critically important for all past societies, better understanding of these environmental parameters is essential (Halstead and O'Shea 1989). Changes in the ancient environment were also subject to the effects of human action on the landscape: the distribution of settlement, use of different agricultural and pastoral strategies, resource procurement (logging, mining), as well as actions taken to retard or offset the local effects of environmental change – agricultural terracing to counteract the effects of erosion, irrigation to offset drought, dredging to combat the insiltation of watercourses, and deliberate burning to encourage the production of browse for animals.

At a larger scale, successful human systems necessarily adapt to a more or less predictable range of environmental variation. It is not possible to provide here a systematic overview of large-scale Quaternary climate affecting the Mediterranean area, human/environment interactions, and anthropogenic landscape modification (see suggested further readings below for general sources). The following is therefore a very general but current outline of large-scale environmental and human changes within which more specific environmental investigations are situated. Late Pleistocene postglacial warming and the retreat of sheet ice in Northern Europe beginning ca. 15 k cal BP fundamentally altered the landscapes of the Mediterranean littoral on a scale not seen since. Where previously this change was generally viewed as a gradual process, in the last 10 or 15 years, a combination of higher-resolution climate data and sophisticated modeling has been used to suggest that past changes in climate may have been sudden, even abrupt, on a decadal scale. The rise in global temperatures manifests itself in dramatic change in sea level, fauna, sedimentary geology, and vegetation regimes across the entire Mediterranean region. The effects on human foragers were dramatic. Both "push" and "pull" effects operated as humans expanded into newly habitable areas. In contrast to the warmer conditions of the Bølling-Allerød interval, the Younger Dryas, between about 12,800 and 11,600 cal BP, represents a late glacial reversion, a return of cold and dry conditions. Significantly, some human groups in the Levant increased their exploitation of the wild ancestors of wheat, barley, and rye; suids, ovicaprines, and bovines; as well as other species which proved less susceptible to selection for the modified behaviors that resulted in domestication (Bar-Yosef and Belfer-Cohen 2002). The Early Holocene Wet Phase (EHWP) 10,000–7000 kcal BP coincides with the Neolithic in much of the Mediterranean basin. A return to wetter conditions after the Younger Dryas, it provided favorable conditions for the dispersal of these newly domestic species to areas outside their original range. The period 7000–5000 cal BP witnessed a remarkable range of adaptations to mid-Holocene environments. In the period since ca. 5000 cal BP, human action had ever more potent effects on local landscapes in the Mediterranean. Karl Butzer has proposed (2005) three sustained episodes of intensification of anthropogenic landscape modification: around 3000 BCE, 1300 BCE, and 100 CE,

corresponding, respectively, with the widespread adoption of Mediterranean polyculture and a range of associated agricultural strategies partially offsetting more arid conditions in many parts of the Eastern Mediterranean, the flourishing of redistributive palace economies and long-distance trade in the Late Bronze Age, and Roman imperial expansion, coinciding with the second half of a climatic optimum, a wetter period from ca. 500 BCE to 500 CE. This is obviously a very general framework, and the histories of individual regions vary considerably. The nature and causes of that variation at different scales, spatial and temporal, continue to be subjects for research and debate.

International Perspectives and Future Directions

Both paleoecology and Mediterranean archaeology are inherently international and collaborative disciplines, and knowledge production has to some extent tended to follow the model of the hard sciences (collaborative research, multiple authorship, publication in specialist journals). Most of the scientific literature is in English, German, and French. Initially, archaeologists working in prehistory were the most avid consumers of environmental data, while those dealing with the first millennium BCE and later have too often tended to disregard environmental components of the archaeological record, but increasingly environmental studies are regarded as valid lines of investigation.

To some extent it is difficult to forecast any direction for such a diverse group of scientific fields and techniques. However, the collection of different kinds of environmental data, and the continuing refinement of analytical methods makes invaluable contributions to understanding individual archaeological sites and regions. Specialized laboratories and "centers for the study of" contribute a growing volume of research, and as understandings of the various categories of environmental record improve, so will researchers' ability to design sampling strategies and interpret rich, high-resolution data. At the same time, the integration and comparison of disparate data sets will become correspondingly important for understanding human responses to, and anthropogenic impacts on, the environment at all different scales. Particularly important are changes in the structure of variation – the understanding of "normal parameters" on which all human subsistence strategies are based. Many archaeologists have been able to identify cases of anthropogenic landscape alteration through evidence of erosion, changes in representation of important plant species, aridification, and other indicators of stress. These cases are an important part of the record, but it is equally important for archaeologists to seek to understand how people managed Mediterranean environments to support big increases in human and domestic animal populations, vast accumulations of stored surplus, and the extraction of resources.

The study of Mediterranean environments is a dynamic and expansive field. Plagued in the past by simplistic and overgeneralized explanation, models of the relationship between people and the environment are in the process of shifting from a search for simplistic, straightforward cause/effect relationships between two variables, to integrative and complex, using more analytically sophisticated approaches to interrogate a growing number of data sets.

Cross-References

- ▶ Agrarian Landscapes: Environmental Archaeological Studies
- ▶ Anthropogenic Environments, Archaeology of
- ▶ Archaeobotany
- ▶ Cultural Ecology in Archaeology
- ▶ Geoarchaeology
- ▶ Landscape Archaeology
- ▶ Landscape Domestication and Archaeology
- ▶ Paleoethnobotany
- ▶ People as Agents of Environmental Change
- ▶ Radiocarbon Dating in Archaeology
- ▶ Zooarchaeology: Methods of Collecting Age and Sex Data

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Further Readings

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Ephemeral Art

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Introduction

The archaeology of art is a term that includes a wide range of artworks. One of the most challenging is ephemeral art. This term hides a complex reality that encompasses different understandings of art: from body painting to temporary housing or furniture created for special occasions such as pilgrimages or coronation ceremonies. In fact, studying ephemeral art from an archaeological point of view seems contradictory because something ephemeral does not leave material traces. However, material culture gives us some clues to understand the presence of the ephemeral in artworks. The following sections address how archaeologists can investigate this type of art not only through ethnoarchaeological case-studies but also through the material culture left behind in the production of ephemeral art.

Definition

From an archaeological point of view, ephemeral art deals with temporary artworks and performances that have archaeologically low visibility. However, they can be reconstructed not only through direct remains, if conservation conditions allow it (traces of makeup for instance), but also by indirect or secondary sources (musical instruments, masks, containers of pigments used as makeup, written sources, or images). Generally speaking, ephemeral artworks are related to all kinds of rites and performances (political, religious, and so on) and, thus, this art is somehow cyclical. In this entry, the terms ephemeral and temporary are used as interchangeable concepts.

Ephemeral art includes different forms. The clearest example of temporary artworks are the performing arts, including music, and its related concepts of sound and acoustics, dance, and drama, such as recitation, theatre, or poetry. Body and facial painting and hairdos are also forms of ephemeral art as are some objects worn on the body, especially crafted for a particular event such as paraphernalia used in dances or other performances. The venues where performances have been enacted can also be studied as indirect evidence of ephemeral events. Furthermore, ephemeral installations or objects for temporary gatherings or ceremonies have been recorded.

This archaeological definition clearly differs with the one proposed by contemporary art history. This definition describes ephemeral art as only lasting for a short period of time, and the term is normally used to describe a work of art that only occurs once and cannot be embodied in any durable object to be shown in a museum or gallery. However, ephemeral art must be treated differently when dealing with archaeological remains due to the peculiarities of the materiality of the ephemeral. Firstly, the duration of the artwork is uncertain for most cases; time can be understood differently in differing periods and places. Secondly, the ephemeral from a material cultural perspective has demonstrated that it occurs more than once and, fortunately, is embodied or materialized in durable objects. The concept of ephemeral artworks emerges from the mid 1960s in connection to a wave of criticism from western artists and art critics dissatisfied with the so-called establishment artists and with the commodification of art pieces. Indeed, throughout the twentieth century, performance was often seen as a nontraditional way of making art. In order to break with the traditional art market, artists explored other venues and methodologies to create their pieces with no financial value. One of the best strategies to put the artworks outside of the market was to create ephemeral events that could neither be sold nor exhibited. Thus, artists were more interested in the process and the action of the artwork rather than the objects themselves. The so-called action art includes different types of ephemeral expressions like body art, Land art, or actions like Happenings or Performances.

Historical Background

The archaeologies of art are strongly based on morphological and stylistic aspects, and as a consequence, ephemeral artworks have not been considered proper materials to analyze by the above mentioned approaches. Visual and representational arts have been the focus of morphological and stylistic studies and neglect other types of artworks which go beyond the pre-eminence of the visual and the study of forms. However, this approach is changing because more comprehensive and multisensorial studies of artworks are being undertaken. The emergence of post-processual approaches to the past drew attention to the intangibles such as emotions, senses, music, or sound, all of them connected to the ephemeral.

The commonest approach for the study of the ephemeral is through indirect or secondary material, and textual, resources. Interestingly, most of the objects used to study the traces of the ephemeral are by themselves artworks because they consist on reliefs, depictions, sculptures, or musical instruments that represent temporary events or ephemeral materials. This circumstance provokes the interest of the researchers in – more often than not – the formal and stylistic features of these pieces of art rather than the temporary events that these pieces of art show. It is certainly true that iconographic studies focus on the significance of what is being represented (dancing and music scenes, enthronement ceremonies) but all these temporary events and the material and corporeal traces are not studied independently as ephemeral artworks.

However, material-based disciplines, such as ethnography or archaeology, have not neglected ephemeral art. Due to the richness of sources and, sometimes, direct observation, the complexity of the ephemeral art has been recorded. For example, two case-studies are worth mentioning: first, body painting among the inhabitants of Tierra del Fuego (Argentina), specifically the Selk'nam and Yámana, have been studied using photographs, drawings, and texts. This study shows the complexity of body painting in creating multiple identities (gender, age, myth, and kinship) during the performance of rites of passage that brought young men into spirit-initiated adulthood (Fiore 2005).

A second example is based on Yolngu art (Australia), more specifically on chest-paintings that boys receive during circumcision ceremonies (Morphy 2009: 14–22). Because these body paintings seldom last for more than a few days, this case nicely exemplifies to what extent ephemeral artworks are meaningful in the broader social context. The paintings are performed in semi-restricted spaces to which only a few people are allowed entry. Equally, this temporary body painting is stage-managed by ritual experts, members of the clan, who sing songs connected to the paintings and the ancestors manifested in the images. In addition, the paintings have aesthetic qualities (shimmering brilliance) and create social and spiritual links between the boy, his family, their ancestors, the artists, and other households of the community. In all, the temporary paintings "exists as a much more widely connected and durable object than the instances of its production allow" (Morphy 2009: 16).

Thus, anthropological and ethno-archaeological approaches make clear that ephemeral works of art have a strong social significance and participated actively in the ceremonies of identity creation. Paradoxically, some of these non-lasting artworks have been collected by Western collectors for display in museums and become permanent artworks. This is also the case of the Malanggan statues which were meant to decay in funerary ceremonies in order to strengthen and secure the memory of the deceased (Küchler 1988).

Key Issues/Current Debates

A wide range of case-studies provide examples of how archaeology can be used to examine aspects of ephemeral arts. Luckily, the archaeological methods allow the recovery of temporary performances and events. Beyond the iconographic analyses and the indirect materials already mentioned above, archaeometric studies like, the analysis of pigments and contents deposited on vessels or computational programs to recover the acoustics

of special settings, are providing considerable data about ephemeral artworks and their social role. In this section, I will analyze ephemeral body art, which is probably the most well-known instance of temporary artworks. Then, performative arts will be covered indepth: music, dance, and acoustics. Furthermore, ephemeral events and temporary gatherings will be also considered.

Studies about the social role of bodies have recently highlighted their active role in creating and participating in social dynamics, because bodies mediate our relationship with the world around us. These premises are based on the phenomenology of Merleau-Ponty that expresses how our bodies are the medium for having a world, and Bourdieu's notion that the body structures both how we act and how we perceive. Within this framework, a self that acts on the world necessarily does so through the medium of the body and, thus, are active participants in social and cultural constructions (Robb and Harris 2013). Archaeologists have used embodiment insights especially in examining the representations of bodies from an art-historical perspective. Indeed, iconographical studies have largely studied how corporeal representations show a wide variety of bodies portrayed (from stone anthropomorphized stele to clay figurines), and this heterogeneity highlights how the body is a cultural construct.

Bodies have been throughout history one of the most well-recorded arenas to install art. In fact, among the diversity of modes of body art, the ephemeral corporeal art has been a constant: body and facial paintings are the clearest examples. Ochre pieces recovered from the Porc-Epic Cave, Ethiopia, dated at Middle Stone Age (MSA) have been analyzed by microscopic identification for traces of modification, morphological, and morphometric analysis or surface texture analysis, amongst others. The results show patterns of continuity in ochre acquisition as well as traces of ochre modification by grinding and scraping to produce a red powder. These materials have been interpreted as proofs for body painting imbued not only with symbolic meaning but also with practical functions like insect repellent, antiseptic treatments, or sun protection. Equally, the existence of different shades and colors of ochre have been inferred by the variety of ochre types and the identification of different processing techniques (Rosso et al. 2017).

As direct material traces are scarce, iconographical approaches are a basic tool to reconstruct these phenomena. Moreover, materials that participated in the corporeal art that outlast bodies are paint residues, pigments, painting tools, or the container used to store the paint. The material record of corporal paint appears in highly ritualized scenes such as public enthronement ceremonies, enactments like music, dances, competitions, playing, different kinds of parades, and funerary rites among others. Although, the participants of these rites are, in the vast majority of cases, members of social elites, it is worth mentioning how in some representations commoners showing body decoration appear. Furthermore, paint containers and tools to apply the colors have been recorded, whether in houses or in tombs, without any traces of a social range. Interpreting body decoration, in this case the ephemeral one, as a privileged material strategy in the construction of the social-self has been stressed. The consideration of this bodily art in its transmitting personal and social information to intimate or distant audiences and, thus, contributing to the construction and maintenance of social networks, is worth recalling.

Studies of the pre-Hispanic Maya society deal with a comprehensive approach to ephemeral body painting. A combination of archaeometric studies applied to define the raw materials used in the preparation of pigments, together with iconographical studies with scenes of humans and divinities decorated with this ephemeral art, sheds light on to the complexity of this phenomenon. Analytics to the residues found in several containers show that the substances used to prepare body painting were based on organic material and from animal origins. The analyses show that most of the iron-based colorants were highly available from cultivation areas of Maya agriculture and were nontoxic. In addition, a combination of cinnabar and hematite has also been recorded. Other mineral colors have been identified, like limenite or ilmenite, both available locally and with good coating capacities. Interestingly, the

presence of animal fat as an excipient in some of the pigments suggests the existence of scented body colors, especially to embalm royal and aristocratic corpses. Iconographical studies show how important body painting was for the Maya elite, especially on the whole head, face, and the upper torso. Significantly, the act of being painted by servants provides information about the tools and the containers used to apply the paint, such as clay vessels or stamps that, luckily, have also been recovered in archaeological excavations (Vázquez de Ágredos Pascual et al. 2018.

Moving to the next case-study, performative arts are by definition ephemeral. Several studies provide us with information about ephemeral events, activities, and materials. Music is probably the most studied. In fact, the interest in musical activities from an archaeological point of view deals with the relationship between music, human cognition, and the complexity of ancient cultures. The role of music in human evolution is a current debate being investigated by a great diversity of fields beyond archaeology and anthropology like neuroscience and psychology. It is generally agreed that our ability to perform and enjoy music was an important step in early human evolution, and it was a fundamental communicative strategy that created outstanding emotional and social bonds (Morley 2013).

As already noted (see Types of Arts), archaeomusicology is the methodology by which archaeologists and musicologists recover the sound of the past; also known as "music archaeology." This study researches the sounds and the musical cultures through the examination of archaeological events, and it is closely connected to ethnomusicology, acoustics, experimental archaeology, ethnoarchaeology, iconography, and organology (García Benito and Jiménez Pasalodos 2011).

A key issue in the archeomusicology is the study of musical instruments and sonorous artifacts recovered from archaeological excavations. Although a great number of potential instruments – or some parts of them – have been lost because they were made of perishable materials or were bad preserved, some methodological proposals have been created to classify these artifacts. Paleo-organology is the subdiscipline devoted to the study of sonorous objects and instruments. Experimental archaeology is fundamental in discerning if the sonorous objects were intended to perform music, to analyze the production processes and their morphology, and determine their musical and acoustical properties as well as their uses and functions (García Benito and Jiménez Pasalodos 2011). The earliest musical instruments so far documented are from the Geissenklösterle Cave (Germany). They are three pipes from Aurignacian contexts (36, 800 BP): two are made of swan bone and another was carved from mammoth ivory (Morley 2006: 318).

One of the key publications that sets the frame of the discipline was World Archaeology (1981, volume 12, issue 3) devoted to music. In this volume a major contribution by the Scandinavian archaeologist Cajsa Lund (1981: 246–248) proposed a methodology and classification to identify musical instruments. It is based on a probability-grouping system. This a classification of sonorous artifacts which goes beyond the definition of instruments and introduces objects not intended exclusively in performing music but with sonorous properties. This proposal has become an alternative or a method to combine, where possible, with the traditional type-classification of musical instruments by Hornbostel and Sachs (1961): idiophones, membranophones, aerophones, and cordophones.

Additionally, the so-called sounding stones, rock gongs, or lithophones are also worth mentioning. They are rocks interpreted to be instruments. C. Fagg states that they are "naturally situated and naturally tuned rocks, boulders, exfoliations, stalactites and stalagmites which resonate when struck and show evidence of human use as idiophones" (quoted by Díaz-Andreu and Mattioli 2017: 9). It is attested in contemporary African societies but also among the European Upper Palaeolithic and the Bronze Age, in the form of stones at open-air Scandinavian sites (see Díaz-Andreu and Mattioli 2017: 11–12 for more worldwide case-studies with specific references).

A case study that shows the potentialities of this methodology has been recently undertaken to study the organological possibilities and musical

performance of the most complete gravettian aerophone from the site of Isturitz (France) (Mazo Pérez et al. 2015). The study is based on two replicas of the original made from the ulna of a Griffon Vulture and have been obtained through a "chaîne opératoire" of very simple actions. The main result of this project has been to demonstrate that these objects could have produced sound in three ways: obliquus flute, horn, or clarinet (Mazo Pérez et al. 2015: 84 and Fig. 10, see especially the QR code that allow the reader to listen the music of the instruments). Therefore, it has been argued that these instruments made from bird bones cannot be defined as flutes because they produce sounds in other positions. Thus, the study proposes to label these instruments as aerophones.

Iconographic studies applied to musical scenes shed light onto organological aspects of instruments (number of strings or hands position when performing; amongst others) as well as social aspects such as the gender of the musicians, their status through their appearance, or the contexts where music was played (e.g., funerary processions, royal ceremonies, banquets or myths). This methodology has been applied to proof the use of membrane drums in pre-Columbian Mississippian Culture (Rees 2013). This case-study presents a re-examination of iconographic images engraved on some marine shell artifacts found on the Spiro Mounds (eastern Oklahoma). In addition, it is also argued that the drums and their sound were considered sacred objects related to shamanic practices.

Moreover, ancient texts are valuable sources in providing musical theories and even the lyrics of the songs. Indeed, the most ancient written sources about music and the musicians' era are dated at the third millennium BC in Mesopotamia. Stunning examples are the ancient Egyptian love songs, mostly dated between 1292–1070 BCE. They were recorded on papyri and ostraca and are short texts with a maximum of seven stanzas; some of them explicitly state that the texts recorded had to be sung. Interestingly, some of these songs are currently performed using a replica of an ancient Egyptian lute from the Dynasty 18 (Köpp-Junk 2018).

The study of sound is also a relevant methodology to recover the ephemeral in archaeology. Archeoacustics is the discipline that refers to the study of the effects of sound in past societies. This research highlights how acoustics can be a key element in deciding the location of artworks. In this sense, some case-studies have demonstrated that exceptional acoustics would have been selected and/or created to undertake and to perform not only artistic creations but also ritual activities. Thus, sounds and acoustics can be labeled as ephemeral arts as they are closely associated to types of art (rock art, portable or architectural). As stated by Díaz-Andreu and Mattioli (2017: 1) "scholars interested in acoustics try to understand the human past beyond its materiality by recovering a set of less evident, less tangible cultural signs relating to the sense of hearing."

The interest in archeoacoustics was initiated by a connection with Prehistoric rock art. The pioneering studies of Reznikoff and Dauvois (1988) highlighted the relationship between fixed art in European caves and the cave's acoustic properties. In their interpretation, some signs, such as points, were interpreted as marks on rocks with such properties. Waller (1993) related the contents of the panels with acoustics: carnivore animals are painted on rocks with low acoustics because these animals are quiet. On the contrary, ungulates are represented on panels with high acoustic properties as trying to reproduce their sounds. In all, it is likely that echoes, resonances, and reverberations are desirable acoustic effects in connection to location of different types of artworks.

This type of research has also been applied to megalithic architecture. Research conducted in the hypogeum Hal Saflieni (Malta) has revealed that the best resonance occurs in the Oracle room, precisely the only one with decoration (see Díaz-Andreu and Mattioli 2017: 15–16). Acoustic tests have been used to examine if the primary resonant frequencies are suited to a male or female voice. For example, results on Gravrinis cairn (Brittany, France) using the human voice and a low-frequency generator show that female voices were heightened in some orifices on orthostat 18, located at the end of the chamber (Manaud and Barrandon 2015).

Archeoacoustics in much modern monumental art have also been tested. For instance, the late antique Basilica of San Vitale at Ravenna (sixth cent AD) (Italy) presents an acoustic that facilitated and enhanced the liturgical function of the building as a congregational church. Sound propagation, reverberation, and clarity was measured to prove the direct relationship between ritual vocal sound making and the response of the acoustic features of the space. This study has concluded that the play between vocalization and architectural ritual structure were closely related to provoking a multisensory experience (Knight 2013).

Closely connected to music and sound is dance. Certainly, dancing is an activity that does not leave direct visible remains and can be defined as a purposeful, intentionally rhythmical, and culturally patterned sequences of nonverbal body movements. Dancing – patterned movement – is a multisensorial experience with a prevalence of kinetic features (Garfinkel 2003; Soar and Aamodt 2014). Dances are relevant social activities that entail multiple cultural meanings according to each social group. Among the diverse functions of dancing stands out its role in creating a sense of community, as a means of social control, as medium for competition, and so on. Dancing is frequently connected to religious ceremonies because dancing can be a spiritual practice to get in touch with divinities or other-worldly beings. Several ethnographic studies have analyzed the role of ecstatic dances to achieve altered states of consciousness (Garfinkel 2003).

There are numerous and varied artworks that refer to dancing scenes. The range of supports where dancing scenes are identified include terracotta figurines of a groups of dancers, paintings on vases or walls, architectural engravings, and large sculptures. Generally speaking, it is not easy to interpret the figures as dancers due to the technical problems of representing movement in static supports (Garfinkel 2003: 18). However, there are some methodological suggestions to allow the interpretation of some performances as balls (partially based on Garfinkel 2003). These include:

- Figures follow patterned body gestures that express their kinetic features. They present a dynamic gesture, sometimes with their legs or their arms bent.
- Overrepresentation of hand and fingers due to the communicative capacity of these parts of the body.
- Group scenes reflecting interaction between people. Sometimes the figures in any particular scene are normally identical or combine patterned body positions.
- Outstanding body decoration like facial makeup, masks, or elaborate hairdos and dresses.
- Presence of musicians or dancers themselves playing instruments, clapping hands or with the mouth open indicating that they are simultaneously singing.

The prehistory of Asia shows dancing scenes in an array of different supports like jade pendants or bronzes vessels. This activity was not only performed by the elites but also was an element of popular culture and entertainment. For example, the funerary art of the Han dynasty (202 BC-220 AD) records reliefs representing different kinds of dances (Zuchowska 2014). These performances were incorporated in banqueting scenes and were not only intended to entertain the deceased during the afterlife but also to display the social importance of this activity for the Han's elites. In these artworks, the limits between dances, acrobatics, and martial arts are blurred and most of the features mentioned above to identify the patterned movements are identified by features such as the coexistence of musicians or special outfits.

Theatrical performances and some public events are ephemeral types of art. Their political implications in creating, maintaining and disrupting asymmetrical power relations has been analyzed in depth by multiple case-studies (some examples in Inomata and Coben 2006). As already noted by the same authors (2006: 29) the analysis of theatrical performances poses a challenge to archaeologists as we cannot observe them directly. Nevertheless, they can be satisfactorily recovered by analyzing the venues and the stages, the images in these events, and the objects used in the performance. Monumental architectures such

as theatrical spaces, plazas, some temples, or palaces are the stages where such performances took place. In addition, dramatic landscapes have also been used to locate enactments, although their archaeological visibility is lower in terms of installations but they can be rich in terms of objects, some artworks, deposited in such areas.

Research to uncover the features of such performances try to reconstruct the visual and acoustic features of the performances from the double perspective of the "actors" and the observers. Three-dimensional reconstructions of the venues and spatial analysis help to elucidate the distance between performers and audiences, the kind of communicative acts within the capability of human perception (facial expressions, verbal, musical performance, etc.), or the estimated number of participants. Images of performances give us information on the aesthetics of the performers or the objects involved. In addition, they can also be used as sources to remember former performances and can constitute the visual basis for rehearsals in preparing future ceremonial acts (Inomata and Coben 2006: 30–31). Some of these images, as well as the written descriptions of the performances, illuminate the existence of ephemeral artworks to decorate the settings such as banderols, tapestries hanging on the buildings, or furniture created purposely. This avenue of research has been undertaken especially in historical archaeology.

An archaeological study of ephemeral events and temporary gatherings in the contemporary world can be beneficial in recovering all the steps that occur in an ephemeral ceremony, from the study of the preparation, the performance and the afterwards. Equally, research on current temporary festivals can provide insights into the material culture and the practices of participants in the events and the sites created and destroyed by the participants. White (2013) analyzed the "Burning Man Festival," organized in northwestern Nevada, which occurs annually and entails the construction of an effigy of a man that is burnt at the end of the festival. Equally, the organizers and participants build and remove the ephemeral city, the Black Rock City, where they stayed during the festival. This city holds upwards of 50,000 participants and the setup phase of the city began with a ceremony to mark the placement of the man. Its location marks the placement of the city centre and, then, the rest of the city is laid out. The climax of the festival is the burning of the man in a huge pyrotechnic bonanza. Remarkably, the end of the festival is hardly the end of the event because it takes two weeks to remove all the structures and objects used during the gathering.

Another relevant methodology in recovering the ephemerality of material culture has been undertaken in ritual sites of Australia and Papua New Guinea. More concretely, archaeological fieldwork has recovered how some ritual activities of the islands of Torres Strait were inscribed at *kod* sites (ceremonial men's meeting places) through distribution of clan fireplaces, mounds of stone/bone, and shell. The ceremonial sites are located within spectacular natural landscapes with the central area dominated by large granite boulders. The disposition of a series of materials, which can be labelled as artworks, such as a network stone arrangements, stone-lined structures and the presence of shells and large dugong bone mounds, would have been the setting to enact the rites. Furthermore, the microscopic analysis of lithics and dugong bones suggest bone-working activities (Wright et al. 2016.

International Perspectives

A number of studies carried out by European scholars are challenging the stylistically/typological and iconographic approaches to the archaeologies of art. They open up new avenues of research based regarding the process of creating artworks, and the emotional and sensorial consequences. Recently, material-based studies on art are more interested in the processes of formation rather than with the final object being or not art. They focus on so-called ephemeral technological innovations, which revolve around signaling "moments of technological experimentation and innovation that may have been culturally significant even if they were not widely accepted or shared" (Farbstein 2013: 26). The same author exemplifies this approach on prehistoric Pavlonian art (Czech Republic at c. 30,000 BP).

The ceramic figurines of these sites have been interpreted as intentionally made to be broken. Intentional thermal shock was purposely done to have a loud noise when they exploded and, thus, an ephemeral pyrotechnic performance took place. However, this "action art" was not crafted in all the sites with Pavlovian ceramics. The key element of the analysis are the legs of the clay figurines representing animals: whereas at the site of Dolni Vestonice legs are compressed, a technical feature that promotes stability and not fracture when exploding. At the site of Pavlov I they do not present compressed limbs thus facilitating their breakage. Therefore, analyzing the process of crafting an artwork show how ephemeral local innovations are key elements to consider when facing artistic materials (Farbstein 2013).

Secondly, the materialization of states of being through visual and performative arts presents a close link with the ephemeral as a priori emotions are temporal. The avenues of research connecting emotions and artworks are twofold: the emotional content of the art pieces and the emotions created by artworks. Iconographical studies have disclosed the array of emotions according to the facial expressions and body gestures. Interestingly, sensorial analysis of artworks also show how artworks created sensorial connections between the objects of art, their users, and viewers and their emotions through the exploitation of senses. Jo Day (2013) nicely illustrates the entanglement of artworks and the senses, which is a temporary experience. She studies stone blossom bowls and ceramics with reliefs of flowers and petals from Minoan Crete and argues that both artworks were intended to enhance real aromas and caused metaphorical olfactory responses.

Future Directions

Recovering the ephemeral is a stimulating task that all archaeologist interested in art should consider in order to have a comprehensive approach to the creation, meaning, and understanding of artworks in the past. It is a wide label encompassing a diversity of artistic creations and approaches. Although some caution is required when dealing with secondary or indirect sources as any representation involve elements of idealized and stereotyped notions that may hinder our access to such phenomena. Approaching temporary creations with this methodology may provide clues to cultural notions in this matter. In addition, archeometric analyses and computational programs will be essential methods to improve our knowledge of ephemeral arts like body painting, the sounds of past music or the acoustics, and visibility of architectures where performative arts were enacted.

Cross-References

- ▶ Archaeology and Art
- ▶ Archaeology of Art: Theoretical Frameworks
- ▶ Art, Types of
- ▶ European Upper Paleolithic Rock Art: Sacredness, Sanctity, and Symbolism
- ▶ Pigment Analysis in Archaeology
- ▶ Sensory Archaeology
- ▶ Style: Its Role in the Archaeology of Art
- ▶ Techniques of Paleolithic Art

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Epigraphy, Greek

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Introduction

Scholars of the ancient world are often frustrated in their endeavors by the vast amount of material which has been lost due to the passage of time. One area of ancient scholarship in which the amount of available sources continues to increase is in the field of epigraphy, or the study of inscriptions. For this and other reasons, epigraphic anal-

ysis is proving to be of increasing value in the study of virtually all aspects of the ancient world, including social issues, religious aspects, political and economic decision-making, and social connections between groups or individuals.

Definition

Greek epigraphy is generally defined as the study of writings in the Greek alphabet which are inscribed upon durable artifacts. The materials on which the inscriptions are placed include not only stone (although the majority of epigraphic documents are indeed inscribed on stone) but also bronze, pottery, and other objects. Inscriptions may be movable, such as those on pottery, gems, weights and measures, tesserae, bricks, and tiles, or they may be immovable, such as graffiti and other inscriptions found on walls. Inscriptions on coins are properly the domain of numismatists, while texts on less durable materials belong to the field of papyrology; paleographists study ancient handwriting. The length of an epigraphic text may vary from a single grapheme to an extensive document, such as laws, oaths, or catalogues.

Even in antiquity there was interest in studying and collecting inscriptions. As early as the third century BCE, Krateros, the brother of the Macedonian king Antigonos Gonatas, published a collection of decrees relating to the history of Attica, known as the Ψηφισμάτων συναγωγή. Although this work is lost, it is regularly referred to by later authors including Harpokration. In later periods, a long series of travelers, including Cyriac of Ancona, included inscriptions in their descriptions of ancient sites.

Key Issues and Current Debates

Epigraphy is generally considered an auxiliary science and increasingly has become an important tool for archaeologists and historians of the ancient world. However, the study of inscriptions can be a difficult skill to master, due both to the presence of some complicated technical conventions observed within the discipline as well as organizational issues in the publication and dissemination of inscriptional evidence.

Most inscriptions from antiquity which have survived are damaged in one manner or another, either from the simple passage of time and exposure to the elements or through other methods including accidental breakage, vandalism, or wear arising from the reuse of ancient blocks as construction materials. Many inscriptions are found in the course of systematic excavations of important ancient sites, but many others come to light by accident, through rescue excavations or through the demolition of older buildings and modern construction work which may uncover ancient remains.

After the discovery and cleaning of an inscription, the task of the editor is to decipher what remains and, in the case of damaged or broken texts, to estimate, as closely as possible, how much of the original inscription has been preserved and to make an attempt to restore what has been lost. Greek inscriptions are engraved in unbroken lines of capital letters, without spaces and with virtually no punctuation to indicate the beginnings and ends of words; the lack of spaces and punctuation, combined with the damage or wear on most inscriptions, complicates the task of the epigraphist, who must produce a text in which word divisions, punctuation, and diacritical marks are present. In deciphering an inscription, therefore, it is often helpful to use such tools as photographs taken in various degrees and at various angles of light or through the production of a squeeze, which generates a reversed, three-dimensional copy of the text. Increasingly, advances in technology are allowing epigraphists to recover lost portions of text from very damaged areas of inscriptions; such tools include the use of three-dimensional white light scanners and infrared light to reveal letter traces that cannot be seen with the naked eye.

In addition to the difficulties presented by the manner in which inscriptions were carved and the damage wrought by the passage of time to many of the texts, the study of Greek epigraphy is complicated by the fact that the inscriptions display specific characteristics which directly relate to the area and era in which they were originally

produced and erected. Regional differences in dialect and alphabets abound; the orthography, language, use of abbreviations, and other aspects of inscriptional texts also vary depending upon the region in which the inscription was produced and the historical circumstances of the time period in question.

The earliest Greek inscriptions date to the early Archaic period (eighth and seventh centuries BCE). The Greek script had Semitic origins, and early inscriptions often are written from right to left, in imitation of the manner of writing common in areas using Semitic scripts; different Greek communities also began to develop their own sets of letters, known as epichoric alphabets. Some early inscriptions also demonstrate a style of writing known as boustrophedon, or "ox-turning"; in boustrophedon inscriptions, alternating lines of text read from right to left and then left to right, often with the letter forms in each alternate line also being reversed. As time went on, increasingly a more general alphabet began to be used, and the orientation of the script settled into a left to right direction. In the sixth century BCE, the stoichedon style of inscription developed; in stoichedon inscriptions, the letters are aligned in rows both vertically and horizontally, as if on a grid. In the fifth and fourth centuries BCE, stoichedon inscriptions were the dominant form of official documents in Attica and were also widely used in other areas of the Greek world. The use of the stoichedon style began to decline in the third century BCE, and it was virtually abandoned by the end of the century. It was replaced with a more naturalistic style in which the letters are proportionately spaced rather than each letter being assigned a space of the same height and width regardless of its size; later inscriptions also have a tendency to observe syllabic or word distinctions, so that lines often begin or end with complete words or syllables.

Letter forms also developed over time, and more experienced epigraphists can often offer an estimated date for an inscription simply by examining the stylistic characteristics of the text. Epichoric alphabets had virtually died out by the fourth century BCE; an Athenian decree of 403/2 BCE made the use of the Ionian alphabet compulsory in all official Athenian inscriptions, and other states followed Athens in adopting the Ionian alphabet, so that it became the standard script of Greek inscriptions in the Hellenistic and Roman eras. However, there was a wide variety of variability in the Ionic script, and over the centuries the letter forms evolved in certain ways; it will suffice here to point to the development of broken-bar alpha; the development of lunate sigma and epsilon; the replacement of the letter pi, written with unequal hastae during the Classical period, with a pi in which the hastae are equal; and the addition of apices as decoration on the ends of letters. Some scholars, most notably S. V. Tracy, have been able to trace the hands of various letter cutters by closely analyzing the style of the letters in various inscriptions, and this has allowed epigraphists to date numerous inscriptions which were fragmentary and therefore undatable by other means.

The restoration of missing portions of epigraphic texts must be carried out with reference to the reconstruction of the proportions of the original monument, since the physical dimensions of the surface on which the inscription was engraved has a direct bearing upon any proposed textual restorations. Restorations of illegible passages in Greek inscriptions are often offered on the basis of textual parallels from other similar inscriptions in which the missing portion of text is preserved. Early epigraphists used a variety of methods for restoring texts and a variety of editorial indications to point out places in the document where restorations or other editorial interpolations had been made. The Leiden system of editorial conventions was introduced in 1931 in an attempt to introduce a uniform system of *sigla* to the editing process of ancient texts, and the Leiden editorial conventions have been widely, if not completely universally, adopted by epigraphists since.

Access to the ever-increasing number of Greek inscriptions is complicated by the complex nature of the organization and publication of the texts. The first systematic attempt to publish Greek inscriptions took place in Berlin between 1828 and 1877, under the direction of A. Boeckh, J. Franz, E. Curtius, and A. Kirchhoff. The result

was the publication of the *Corpus Inscriptionum Graecarum*, a four-volume attempt to publish all of the Greek inscriptions from the entire geographic spread of the ancient world. *CIG* arranged inscriptions by geographical area and within each region through the application of general categories, including public decrees, epitaphs, dedications, and religious texts. Unfortunately, even before *CIG* was completed, it was already out of date; the continuous discovery of more and more epigraphic texts meant that the stated goal of publishing all known Greek texts from the ancient world in these volumes could not be achieved.

The main source for Greek inscriptions is now the *Inscriptiones Graecae*, on which work began at the beginning of the twentieth century. *Inscriptiones Graecae* is geographically much less ambitious than *CIG* and focuses on Greece, the Black Sea littoral, and the Aegean islands. Although originally 15 volumes were planned in the series, some never appeared. *IG* suffers from the same difficulty as *CIG*; the continuous discovery of inscriptions has ensured that *IG* is not a complete collection, and many volumes are woefully out of date.

Collections such as *Inscriptiones Graecae* have been supplemented by regional corpora of inscriptions, often published by individual excavators or archaeological schools. For example, the French excavations at Delphi and Delos have produced the volumes of the *Inscriptiones de Delos*, the *Fouilles de Delphes*, and the *Corpus des Inscriptions de Delphes*, while the excavations at Rhamnous, in Attica, under the direction of V. Petrakos have produced their own volumes of inscriptional evidence not contained in *IG*. Some thematic corpora, such as F. Sokolowski's *Lois Sacrées des cités Grecques*, have also been produced to supplement the existing collections in *CIG* and *IG*.

Other efforts to fill in the gaps in publication in the main epigraphic corpora include the *Bulletin Epigraphique* and the *Supplementum Epigraphicum Graecum*. The *Bulletin Epigraphique* publishes the new inscriptions discovered in a given year geographically; while the material is discussed briefly, the texts themselves are not presented in a complete manner. The *Supplementum Epigraphicum Graecum* varies from the *BE* in that it presents the complete texts of all new epigraphic discoveries, including an *apparatus criticus* and brief editorial remarks on the inscriptions. In earlier volumes of the *SEG* series, the editorial language used was Latin, but more recent volumes appear in English. The *SEG* is particularly useful in that it presents complete texts of the epigraphic discoveries of a given year, new readings or restorations that have been suggested in that year for previously known inscriptions, and bibliographical references to new works published by scholars of the ancient world that are concerned with epigraphic materials, as well as useful indexes. Unfortunately, the increasing number of epigraphic finds, and the time necessary to produce the volumes of *SEG*, means that the editors of *SEG* are now several years behind in publishing.

Digital and electronic collections of epigraphic materials are now beginning to be more widely produced and increasingly provide a useful tool for scholars. The Centre for the Study of Ancient Documents (CSAD) at Oxford University is in the process of building an online database of images of its vast squeeze collection of Greek inscriptions. The Packard Humanities Institute (PHI), a nonprofit foundation dedicated to archaeology, music, film preservation, historic conservation, and early education, is developing an online database of searchable Greek inscriptions. This site includes the volumes of *IG* (although the apparatus criticus for each inscription has not been included, only the text of the inscription itself), as well as texts contained in regional and site corpora (e.g., the Athenian Agora inscription volumes); miscellaneous books and collections useful to epigraphists, such as Reinmuth's work on late fourth-century BCE ephebic inscriptions; and links to inscriptions published in scholarly journals and *SEG*. A useful concordance for the inscriptions contained within *IG* and *SEG* has been developed by the Berlin-Brandenburgische Akademie der Wissenschaften and the Seminar für Alte Geschichte at Münster University. Dr. Jürgen Malitz at the Katholische Universität Eichstätt developed the *Inscriptiones Graecae*

Eystettenses, a CD-ROM database for the inscriptions of Asia Minor, one region not covered by the volumes of *IG*. The Center for Epigraphical and Paleographical Studies at the Ohio State University has posted an impressive collection of digital images from their collection of squeezes. The U.S. Epigraphy Project aims to gather and distribute information about ancient inscriptions collected in the United States, and the American Society of Greek and Latin Epigraphy maintains a page with numerous useful links for scholars.

Epigraphy is a valuable tool for scholars of the ancient world because of the vast number and type of inscriptions that exist for study. There is virtually no facet of life in antiquity on which epigraphic documents have no bearing, although they are particularly valuable for shedding light on the social history of the ancient world. Although the content of Greek inscriptions is extremely variable, even very short inscriptions can provide valuable insights when studied as part of a larger group or in conjunction with other types of source materials. Epigraphic materials are especially useful for the study of areas in which the surviving literary sources provide little to no detail. For example, the distribution of funerary inscriptions provides scholars with some insights into patterns of settlement and habitation, while religious texts make available information about the observance of cultic activities and even the existence of smaller, local religious associations or cults unattested by our surviving Greek sources. In recent years, increasing attention has been paid to other facets of ancient Greek life on which epigraphy has some bearing, including the relationship between the vast number of inscriptions and ancient literacy and the connection between an epigraphic text and its place of erection in the physical fabric of a city.

The bibliography concerning Greek epigraphy is far too vast to be adequately covered here, and the sources provided below should be viewed as little more than a convenient starting point. References are provided below to some general works and corpora, to some useful works on specific issues in epigraphic studies, and to other resources mentioned above.

Cross-References

- ▶ American School of Classical Studies at Athens (ASCSA)
- ▶ Archaeological Record
- ▶ Archaeology and the Emergence of Fields: Historical and Classical
- ▶ Classical (Greek) Archaeology
- ▶ Papyrology in the Greco-Roman World

Further Reading

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Epigraphy, Imperial Latin

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Introduction

Inscriptions are a vital source of information for the politics, society, culture, and religion of the Roman world. This entry examines Latin epigraphy in the age of imperial Rome, from the reign of Augustus (31 BCE–CE 14) to the fall of the empire in western Europe (CE 476).

Definition

The study of Latin epigraphy encompasses a range of different types of inscriptions, such as marble statue bases, milestones, bronze military discharge certificates, brick stamps, and engraved household objects. The one common factor is that they were all inscribed, etched, carved, or painted with some sort of text, whether it was a personal name, a dedication, a letter, or a law. This act of inscribing has been dubbed the "epigraphic habit" (MacMullen 1982). Some 250,000 Latin inscriptions have been published to date, with more examples discovered each year. Approximately half of these inscriptions are included in the monumental *Corpus Inscriptionum Latinarum* (*CIL*), a project initiated in the late nineteenth century by Theodor Mommsen. The majority of new inscriptions are published in scholarly journals, such as *Zeitschrift für Papyrologie und Epigraphik* (*ZPE*), but are collected together for ease of reference each year in *L'Année épigraphique* (*AE*).

Historical Background

The age of Augustus (r. 27 BCE–CE 14), the first emperor, witnessed a dramatic increase in the number of inscriptions throughout the Roman world (Bodel 2001: 7–8). This was undoubtedly prompted by Augustus' own transformation of the city of Rome through the construction of new temples and public amenities built with marble imported from North Italy. Many of the new monuments were inscribed with texts in honor of Augustus or members of his family. When Augustus was awarded the title of "father of the fatherland" (*pater patriae*) in 2 BCE, the honor was inscribed in no less than three locations in Rome: the entrance to Augustus' house on the Palatine Hill, the senate house (*Curia senatus*), and on the podium of the emperor's statue in his new forum (*Res Gestae* 35.1). As the emperor made his mark on the city's public spaces, there were fewer opportunities for senatorial aristocrats to be honored in Rome. All public statues in honor of senators, equestrians, or other officials had to be officially authorized lest any private citizen be seen to rival the emperor (Eck 1984). The situation was quite different outside Rome itself: in towns and cities throughout the empire, prominent nobles and patrons were honored with statues and inscriptions proclaiming their virtues and achievements.

Emperors and elites were not the only individuals commemorated with inscriptions in the Roman imperial period. Just over two-thirds of all extant Latin inscriptions are epitaphs, many of which were erected for freedmen, slaves, or ordinary citizens. The texts themselves were carved on tombs, sarcophagi, and funerary urns on the orders of family and friends and often paid tribute to the personal qualities of the deceased. This form of funerary commemoration has been used to explain why the number of inscriptions in the Roman world rose steadily throughout the first and second centuries CE before peaking in the early third century. Meyer (1990) proposed that the relatives of the deceased wanted to record that their loved ones were Roman citizens. This theory helps to explain why there was a dramatic decline in the number of inscriptions after Roman citizenship was granted to all free inhabitants of the empire in CE 212. The crucial concept here is that inscriptions were used as a way of expressing one's status and identity to the outside world. Mouritsen's (2005) study of epitaphs in Ostia and Pompeii has demonstrated how freedmen continued to be honored with funerary monuments even as members of the local town councils abandoned the practice. This peculiarity of the epigraphic habit seems to have been the result of the freedmen wishing to commemorate their emancipation from servile status.

Yet funerary commemoration cannot be the only reason for the rise of the epigraphic habit in the Roman world. We need to consider other forms of inscriptions, such as texts carved on honorific statue bases, milestones, military camps, and public amenities such as baths (Woolf 1996). In particular, it is important to think about the ways in which inscriptions were used to express power. Milestones attesting the construction or repair of roads were inscribed with the extravagant titulature of the emperor and his family members, as a way of marking distances and demonstrating the personal interest of the imperial administration in a specific region (Keppie 1991: 65–9). On a much larger scale, imperial edicts or senatorial decrees were often inscribed on stone or bronze in public places such as military camps or on the walls of temples. These documents were usually first posted in temporary form on a whiteboard, but they could be engraved on the order of the issuing authority or as a result of a decision by provincial communities. The most famous examples of these included "The Achievements of the Divine Augustus" (*Res Gestae divi Augusti*), several copies of which have been found in Asia Minor; "The Decree of the Senate concerning Gnaeus Piso the elder" (*Senatus consultum de Cn. Pisone patre*), known from several bronze copies from the province of Baetica; and Diocletian's "Edict of Maximum Prices" (*Edictum de pretiis rerum venalium*), which was publicly displayed in Egypt, Greece, and Asia Minor. Self-governing communities throughout the empire could likewise order that their decrees be erected in public spaces. This naturally raises questions of literacy, given that it is unlikely that more than 10% of Romans could actually read these texts (Bodel 2001: 15–6). But it is important to emphasize that the act of inscribing decrees and laws in public places served as a powerful reminder of government authority. The visual impact formed part of the message.

The distribution of Latin inscriptions was not spread evenly throughout the empire: each region had its own epigraphic culture. In Spain, inscriptions were concentrated in the southern region of Baetica and the coastal regions of Hispania Citerior, though there were pockets of epigraphic activity in the cities of central Spain (Kulikowski 2004: 34–48). There is also a marked difference in the spread of inscriptions in Britain, with greater numbers being found in the northwest regions, compared to the southeast. This can be explained by factors such as the types of stone suitable for building and carving and the concentration of soldiers along areas such as Hadrian's Wall (Mann 1985). In Gaul, the epigraphic habit was particularly strong in major towns and cities and in regions closest to Italy, such as *Gallia Narbonensis*. Detailed analysis of distribution patterns has shown that settlements on major road networks or those closely connected with the military featured higher rates of epigraphic commemoration than more isolated communities (Woolf 1998: 82–91). These geographic trends show that although the precise distribution of inscriptions was determined by a number of

factors, the epigraphic habit was closely connected to the spread of Roman culture by institutions such as the army.

After the early third century CE, there is a sharp decline in the number of inscriptions, a change which may at least partially be the result of the economic and political crises which plagued the empire in this period, though this view has been nuanced in recent years. There was something of a revival in the fourth century CE, with approximately 50,000 Latin inscriptions dated to the period of Late Antiquity (Trout 2009). The majority of these are Christian epitaphs from the city of Rome, illustrating the way in which the renewal of the epigraphic habit mirrored the formation of new religious communities. However, the number of honorific and building inscriptions declined throughout the Latin west, and many were reused for statue bases or as building materials.

Key Issues/Current Debates

Inscriptions serve as a primary source of evidence for the government of the Roman Empire, as they provide information concerning the administrative posts held by senators, equestrians, freedmen, and slaves. Tabulation and analysis of these positions has enabled scholars to trace changes in the Roman government hierarchy throughout the imperial period. Recent work has shown how inscriptions recording the careers of these officials can serve as valuable sources of evidence for the self-representation of Roman elites (Eck 1997). Scholars have also devoted attention to establishing the reasons for the public display of imperial letters, laws, and edicts in monumental form. The language of these documents, especially the series of edicts surviving from the Tetrarchic period (CE 284–324), can provide important information about the relationship between government policies and imperial ideology (Corcoran 2000: 205–33).

Latin inscriptions have opened up new avenues in the social history of the Roman world, particularly in the study of marginalized groups such as women, children, and slaves (Saller 2001). For example, large-scale statistical analysis of epitaphs has demonstrated the cohesiveness of the nuclear family unit in the imperial period (Saller and Shaw 1984). There are methodological problems in using the ages recorded on Latin tombstones to reconstruct the age profile of the Roman population, given doubts about the accuracy of the figures. The majority of demographic historians now prefer to use model life tables and papyrological evidence in preference to inscriptions. However, epigraphic records can still serve some statistical purposes, as in the case of military diplomas (bronze discharge certificates issued to veterans from the praetorian guard, auxiliaries, and the fleet). These documents have proved useful in determining changes in the ethnic composition of Roman army units throughout the imperial period (Roxan and Holder 1978–2006).

Detailed studies of the text and language of inscriptions can yield valuable insights for social historians. The fragmentary inscription known as the *Laudatio Turiae* (*CIL* 6.41062) preserves the funeral oration delivered in honor of an aristocratic woman (called "Turia," though her real name is a mystery) who lived during the civil wars of the late first century BCE. The eulogy provides important information on marriage and women's inheritance rights. The virtues such as chastity and modesty, for which "Turia" is praised, also feature prominently in epitaphs and honorific inscriptions for other Roman women at all social levels. Given their formulaic nature, the inscriptions do not provide any real insights into the character of the individuals, but they are useful for examining the social expectations placed on women (Riess 2012). Inscriptions on children's tombstones are also often predictable in the way in which they describe the deceased as "sweetest" or "dearest." But the artistic representations of childhood life that accompany the inscriptions can tell us much about the Romans' views of their children and their place in society (Rawson 2003: 336–63).

There are a wide range of Latin inscriptions that illuminate the religions of the empire and its inhabitants. These include a series of inscribed calendars from Italy, such as the *Fasti Praenestini* (*Inscriptiones Italiae* 13.2: 107–145), which mark the dates of festivals and sacred days; the majority of these are dated to the Augustan and Julio-Claudian period. The workings of a senatorial priesthood, the Arval Brethren (*Fratres Arvales*), are revealed by a series of inscriptions detailing their activities at their

sacred grove just outside of Rome. The spread of emperor worship throughout the western provinces of the empire can also be traced through inscriptions, such as monuments in honor of the *Augustales*, freedmen who served as official priests of the state cult. In recent years, epigraphic evidence, including votive dedications and curse tablets, has been used to demonstrate the vitality and variety of religious life in the Roman world (Haensch 2007). This has encouraged scholars to consider the significance of rituals in people's lives rather than dismissing religion, especially state religion, as an empty gesture.

Finally, epigraphic material is one of the most valuable sources of evidence for the development of the Latin language itself, especially when used in conjunction with literary texts such as poems and plays. For example, Adams (2007: 624–83) has analyzed the misspellings in inscriptions to show that the Latin spoken and written in Africa, Rome, and southern Italy was quite different from that in Gaul. Curse tablets discovered at Bath (*Aquae Sulis*) in southwest England reveal the idiosyncrasies of British Latin; they help to demonstrate that the language in the island province was not especially archaic, as once thought. New finds of writing tablets from the fort at Vindolanda near Hadrian's Wall have also shed light on the use of Latin in military contexts (Bowman 1994). One of the most celebrated documents in this collection is a letter sent by the wife of a cavalry officer, Claudia Severa, inviting a friend to her birthday party (*Tab. Vind*. II.291) (http://vto2.classics.ox.ac.uk/index.php/tablets/search-for-tablets?tablet=291).

International Perspectives

There are a number of international projects devoted to collecting and publishing Latin and Greek inscriptions online. The *Electronic Archive of Greek and Latin Epigraphy* (EAGLE) project (http://www.edr-edr.it/Italiano/index_it.php) has several constituent databases, including the *Epigraphische Datenbank Heidelberg* (http://www.uni-heidelberg.de/institute/sonst/adw/edh/). This currently contains some 65,000 inscriptions from the provinces of Dacia, Dalmatia, Macedonia, Moesia Inferior, Moesia Superior, and Thrace, with further regions in progress. A team of researchers at King's College London has created new online editions of *The Inscriptions of Aphrodisias* (http://insaph.kcl.ac.uk/index.html) and *The Inscriptions of Roman Tripolitania* (http://irt.kcl.ac.uk/irt2009/), with *The Inscriptions of Roman Cyrenaica* (http://ircyr.kcl.ac.uk/) currently under development. These online resources have been prepared using EpiDoc Extensible Markup Language (XML) to ensure that epigraphic conventions are accurately represented on the web (http://epidoc.sourceforge.net/). Online resources have also been developed to make specific regional collections available to the public. Images and texts of inscriptions from Spain originally published in *CIL* II can be found at the Universidad de Alcalá website (http://www2.uah.es/imagines_cilii/). The US Epigraphy Project (http://usepigraphy.brown.edu/) contains over 1,500 Latin inscriptions in universities, museums, and other collections throughout the United States. A second, online edition of the Vindolanda Tablets (VTO II) has been developed using EpiDoc XML and features a new word search engine, APELLO (http://vto2.classics.ox.ac.uk/).

Future Directions

The continued development of online databases for the study of inscriptions, featuring images, texts, translations, and commentaries, remains an imperative. Such initiatives will provide scholars worldwide with open access to information on these monuments and their archaeological context. They will be vital in conducting large-scale statistical analyses of the material in order to trace changes in the epigraphic habit over time and its use by different social groups. There is especially wide scope for developing these approaches in the period of Late Antiquity, in which there have been several important developments in recent years. These include the publication of a major work on epitaphs in early medieval Gaul and Spain (Handley 2003), a conference on epigraphic "cultures" held in 2009 (http://www.h-net.org/reviews/showrev.php?id=27361), and the Oxford-based

"Last Statues of Antiquity" project, which examines the decline of the statue habit from c. 280 CE (http://www.ocla.ox.ac.uk/statues/).

Cross-References

- ▶ Aphrodisias, Archaeology of
- ▶ Burial Practices and Tombs in the Roman World
- ▶ Epigraphy, Greek
- ▶ Epigraphy, Latin: Early Through Late Republican

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Further Reading

The best general introduction to the field of ancient epigraphy is Bodel (2001), which contains a number of thematic essays on both Greek and Latin inscriptions written by leading experts in the field. Keppie (1991) focuses on the Roman period, with particularly helpful sections on the carving of inscriptions and the process of reading, interpreting, and dating epigraphic texts. For Late Antiquity, Trout (2009) provides an authoritative summary of recent work.

Epigraphy, Latin: Early Through Late Republican

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Introduction

Roughly in the same period when the last king was expelled from Rome, the Latin epigraphic habit lost its strict dependence on the Etruscan one, which had fostered its development in the preceding centuries. During those same decades,

Etruscan epigraphy itself was undergoing major changes, mainly propelled by scribal schools linked with the great sanctuaries, which precisely at this time began to play a crucial role in Etruscan civic life. Latin epigraphy was far from uniform in this early period, with almost every center boasting its own epigraphic habit as part of a strictly local identity. The city of Tibur, which shared many cultural features with the Italic world (although characterizing itself unequivocally as a Latin city), even introduced the typically middle-Italic letter-rotations. The preeminence of Rome in Latin epigraphic culture was a relatively late phenomenon, clearly accelerated by the suppression of the Latin League in 338 BCE, which led to outright Roman hegemony in all the Latin-speaking region.

Only Praeneste showed a remarkable independence in its epigraphic habit, down to its destruction by Sulla in 82 BCE. Praenestine epigraphy had a distinct late-Etruscan flavor, consisting as it did mainly of captions on bronze mirrors (and less extensively on bronze *cistae*) and of funerary inscriptions on *cippi*. Both epigraphic classes had no parallels in Rome and the other Latin towns (where funerary inscriptions remained highly uncommon until around 100 BCE) but were on the contrary commonplace in most Etruscan cities. The century of the Roman Republic witnessed major changes in the Latin epigraphic habit; numbers increased dramatically, leading to a mass epigraphic production, which was one of the most outstanding features of late Republican Roman culture. Inscriptions emanating from any sort of public institution (the central government in Rome, local governments, magistrates on duty, any kind of commission or body of officials with political as well as religious purposes, etc.) multiplied in a period of unprecedented political struggle (punctuated by at least four outright civil wars), which went alongside an increased competition for power between elites and emerging social groups (and between individuals within each of these groups), an overall strong economic growth, and a general increase in literacy.

Inscriptions became one of the most important media of political propaganda and a product of highly specialized workshops. At the same time, these entirely new conditions fostered the emergence of private epigraphy, almost nonexistent in previous centuries, with the only exception of few votive texts: a feature that sharply distinguished the epigraphic culture of Rome and most of Latium from habits prevailing elsewhere in Italy, especially in the Etruscan world (actually, it was the huge number of private – mainly funerary – inscriptions that made the Etruscan epigraphic corpus one of the largest in the entire Mediterranean area in the first millennium BCE).

In the last decades of the Republican period, almost all features that will be characteristic of Latin epigraphic culture in the Imperial period were already in place; inscriptions belonging to this period are largely undistinguishable from slightly later ones, in their outlook as well as in their content. This is why, in absence of independent dating elements, many chronological uncertainties will inevitably persist, and it is often impossible to tell apart late Republican inscriptions from early imperial ones.

Definition

Epigraphy is by no means a necessary and immediate consequence of the acquisition of writing skills; its development follows the establishment of a set of shared forms of expression which we call *epigraphic habit*.

Messages delivered by inscriptions are only understandable combining text content and material aspects, like the kind of object on which the text itself is inscribed, its shape, dimensions, the context into which it was placed, and so on. An epigraphic culture is the result of a series of choices and can change through time. Latin Republican epigraphic culture was elaborated from the final decades of the fourth century BCE onwards; before that date, less than 50 inscriptions are known (with the exclusion of isolated letters), most of them brief texts scratched on vases.

The birth of this new epigraphic culture is marked by a significant change in quality, rather than in numbers. Even if a significant group of the about 50 inscriptions dated between the end of the fourth and the beginning of the third century are captions on Praenestine mirrors and cistae (more than half of the total number of 28, dated about

380–250 BCE), a couple of dozen inscriptions on stone (only four of them from the city of Rome itself) show almost all the features that will be typical of Latin inscriptions in the centuries to come.

At the beginning of the third century, a major reform in writing took place, showing the involvement of public authorities in matters of written expression that clearly matches the contemporary emergence of epigraphy; the letter Z was suppressed (to be reintroduced around the end of the Republican period in Latin transcriptions of Greek words), and its place was occupied by the G, a C with a diacritical mark. Alteration of alphabetical sequences is a very uncommon choice and shows the high degree of sophistication Roman culture had reached in this period.

In the third century BCE, inscriptions were made either on behalf of individuals, more often than not for religious purposes, or by the state or its magistrates, mostly commemorating public works; the total number of inscriptions on stone belonging into this century barely surpasses the 300, including a great number of Praenestine *cippi* (in fact, about two thirds of the 347 funerary inscriptions on *cippi* from Praeneste seem to belong to the third century; this peculiar local tradition does not survive beyond the second century BCE; Franchi De Bellis 1997). The period immediately following the end of the Second Punic War was another major turning point; in the following two centuries, numbers increased tenfold.

Although the best part of them belong to the period after 120/110 BCE, second-century inscriptions are consistently more frequent than third-century ones. A wide variety of people began to use inscriptions as a media for political or personal propaganda: Roman magistrates are now outnumbered by municipal ones, alongside a number of magistrates of lesser administrative units, officials of cultural associations, private individuals, freedmen and freedwomen, and even slaves.

At least two thirds of the about 3,200 inscriptions on stone dated between 200 and 40 BCE belong into the first century. The epigraphic habit remained mostly the same, although some changes did occur. The main reason for the steep increase in epigraphic production was the introduction of funerary inscriptions (almost nonexistent outside Praeneste until the end of the second century) which opened stonecutters' workshops to a wide range of customers.

Historical Background

Until the very end of the fourth century BCE, Latin inscriptions are found almost only in Rome and Latium. In the last decades of the century, Roman colonization began to create Latin-speaking communities in territories inhabited by peoples who spoke a variety of different languages; Latin epigraphy spread consequently, following not only the foundation of Roman or Latin coloniae (either as entirely new cities or inside already existing ones, like at Poseidonia-Paestum) but also the settling of Roman colonists in conquered territories which took place independently from a colonial foundation.

The impact of Latin epigraphy was very different from place to place. In some regions of Italy, local epigraphic cultures were significantly stronger than the Latin one and remained long unaffected, even when confronted with official documents from the Roman state. This is the case especially of Etruria, but also of the Oscan-speaking word, and of the most relevant cities of Venetia. In Etruria, outside Roman and Latin colonies and territories, Etruscan was the only language used in inscriptions until 90 BCE, the few Latin texts being convincingly attributed to immigrants; somewhere it was used even later, as in inner northern Etruria, where a robust tradition of funerary epigraphy persisted until around 50 BCE, with some documents dating as late as the age of Augustus (a bilingual inscription from Arretium, dated to c. 15–30 CE, provides the latest evidence for epigraphic use of Etruscan).

Nevertheless, the influence of Latin epigraphy became evident in Etruria from the beginning of the second century BCE, through a series of public inscriptions which, though always written in Etruscan language, depended plainly upon Latin models. Etruscan public inscriptions are as good

as nonexistent, before this late reception of Roman habits: there was no local tradition which could be referred to. In Venetia, although Latin inscriptions reporting the decrees of Roman magistrates arbitrating about the boundaries between the allied cities of Ateste, Patavium, and Vicetia reveal the intrusive presence of Latin epigraphy (and the Roman state) already in the second half of the second century BCE, funerary inscriptions, especially in Ateste, follow local traditions until the Imperial age (with a use of the Venetic language until at least the end of the first century BCE); this resulted in a massive epigraphic overrepresentation of colonists settled in the city by Augustus, whose funerary inscriptions on stone monuments greatly outranked the graffiti on cinerary ollae long preferred by the local aristocracy.

In the Oscan-speaking world, a robust local tradition of public epigraphy successfully resisted the pressure of Roman models; it was not the same for funerary inscriptions, completely lacking in Oscan epigraphy until a very late period (100–90 BCE), when they finally appeared following a genuinely Roman fashion. Other regions of Italy behaved differently. In the middle-Italic area, where local populations spoke a mosaic of closely related albeit different languages, the use of Latin in inscriptions spread quickly, independently from the political status the various communities enjoyed. Umbria adopted Latin in public inscriptions before its cities became Roman *municipia*, and the peoples of the Abruzzi were even more ready to accept the language of Rome for their private inscriptions as well (although in a strongly dialectal variety, interspersed with occasional words from the local languages), lacking as they did an epigraphical tradition, after the end of the South Picene experience in the late Archaic period.

From the second century onwards, Latin inscriptions appear even in areas of Italy where other languages were commonly spoken or written. Latin was not only the language of the state of Rome; it had also become the common language which allowed all inhabitants of Italy to understand each other. Outside Italy, on the contrary, Latin inscriptions in the Republican period appear almost only in towns and cities housing Latin-speaking communities (or, at least, groups of individuals, large or small alike) or as markers of the active presence of the Roman state (decrees concerning foreign communities or individuals, milestones, etc.).

In some areas, like the regions of northern Spain inhabited by Celts (the so-called Celtiberians), the development of an epigraphic culture employing the Latin alphabet to write down the local language is a clear consequence of contact with the Romans and knowledge of Roman epigraphic habit.

Key Issues

Legal Documents

One of the most characteristic features of Roman epigraphy is the use of bronze tablets for legal documents of various types (*leges*, *senatus consulta*, *decreta*, *edicta*, *foedera*, etc.). The public inscription of laws and decrees is a typical behavior of democracies first introduced by Greek *poleis* in the Classical period; in the Greek world, however, bronze is very rarely used (and inscriptions on bronze are mostly votive ones, on goods presented to gods in sanctuaries), the most frequent medium for legal documents being stone stelae or cippi (or, sometimes, the very walls of public buildings).

The Roman Republic follows the Greek experience in requiring a public display of acts from the government and the people (although literary tradition records a public display on leather-covered wooden shields even of decrees from the kings). We do not know exactly on what kind of media documents of the first century of the Republic were inscribed, whose existence is attested by ancient historians (like the treaties between Rome and Carthage or the laws of the 12 Tables); actually, the most ancient Roman legal documents on bronze tablets so far known are a decree by a proconsul of Spain (189 BCE; *CIL* I^2, 614) and the *senatus consultum de Bacchanalibus* (186 BCE; *CIL* I^2, 581).

Inscriptions on bronze tablets in other languages of Italy can be older than the Latin ones; although the evidence refers mostly to the

religious or the private sphere (as is the case of the Greek records of loans from the sanctuary of Zeus to the city of Locri or the Marrucinian inscription from Rapino, the Oscan one from Agnone, the Umbrian *tabulae Iguvinae*, the Etruscan *tabula Cortonensis*, which seems to witness a private negotium, even if a public magistrate of the city is named), at least the Osco-Lucanian tablet from Roccagloriosa, dated between the fourth and the third centuries BCE, seems a legal document very similar to the Roman ones. The use of bronze tablets, as a consequence, is probably to be viewed as a product of the wider Italic culture of the fourth and the third centuries BCE rather than a purely Roman invention.

At present, 36 Republican period legal documents on 32 bronze tablets are known (four of them being inscribed on both sides); half of them are preserved only in a small portion (few lines, or even few words, enough only to understand that the text concerned is a law, or a decree, or something related to the legal sphere). Reemployment of bronze tablets is attested six times: in two of these cases, one of the inscriptions is in a language different from Latin (the *tabula Bantina*, *CIL* I^2, 197, carrying a legal document in Oscan language, later than the Latin one, and the *fragmenta Clusina*, *CIL* I^2, 597, with a list of names in Etruscan).

Only a small part of these documents (7, plus 3 of unconfirmed provenance) have been found in the city of Rome; the majority of them came to light in Italian towns and in Spain. Sometimes (especially if a text is preserved extensively enough), it is possible to appreciate a connection between a legal document and the place where it has been found: this is the case, for example,

- The *lex municipi Tarentini* (*CIL* I^2, 590, found in Taranto)
- The *lex de Gallia Cisalpina* (*CIL* I^2, 592, from Veleia)
- The *lex coloniae Genetivae Iuliae seu Ursonensis* (*CIL* I^2, 594 cf. I^2, 1022, from Osuna)
- The *senatus consultum de Tiburtibus* (*CIL* I^2, 586, from Tivoli)
- The *sententia Minuciorum* (*CIL* I^2, 584, from Serra Riccò)
- The two documents concerning political relations between Rome and some peoples of Spain (the *tabula Alcantarensis*, *AE* 1984, 45, and the decretum proconsulis of 189 BCE from Alcalá de los Gazules)
- And others

It is likely that local communities (and sometimes individuals) cared for the inscription of documents which suited their own interest; this is also the case, for example, of Roman legal documents translated into Greek and inscribed in Greek cities (on stone, as local tradition required: in the Greek-speaking world, even legal documents in Latin were inscribed on stone, as is the case – for example – of the *lex Gabinia Calpurnia de insula Delo*, *CIL* I^2, 2500, or the *foedus Callatinum*, *CIL* I^2, 2676).

In other cases, the inscription on bronze was required by the Roman state itself; the public display of laws and decrees on bronze tablets is repeatedly referred to as normal practice in Roman legal sources of the Republican period, even if never explicitly stated on the tablets themselves, as far as our evidence goes.

Other Inscriptions Emanating from Public Authorities

A great number of different categories of Latin inscriptions were put up on behalf of public authorities and were intended as permanent markers of political action.

The Roman state in particular had a huge epigraphic visibility, which dramatically increased though time; its expressions were manifold. Milestones are one particularly striking example of this wide group, their presence ubiquitous in everyday life of many citizens. Although only few of them survive from the Republican period (dating from the third century BCE onwards), as public roads were continuously restored, evidence is enough to understand that they marked every mile, making the travelers remember the author(s) of the enterprise. Since road building had a very deep impact on Italy and the wider Roman(ized) world, the propaganda effect milestones could deploy and can be hardly overestimated. Another category of public inscriptions which had a deep impact

in everyday life of people directly involved were boundary markers, for example, those referring to allotment of public land to colonists (land often obtained through expropriation from conquered communities).

Other kinds of boundaries defined by the Roman state were, for instance, those between allied cities (probably following a request for arbitration; see *CIL* I^2, 633–4 and 2501, between Ateste and Patavium of 141 or 116 BCE, and *CIL* I^2, 636, between Ateste and Vicetia, 135 BCE), the limits of public land not to be built up (e.g., *CIL* I^2, 2516, from the colony of Ostia), the pomerium of Rome where burials were not allowed (*CIL* I^2, 838–9), or the area around the Tiber to be kept clear (*CIL* I^2, 766). Local authorities followed the Roman example in making their presence being felt in similar circumstances.

Votive Inscriptions

The proportion of votive inscriptions in Latin epigraphy of the Republican period (c. 15%) is consistently higher than in the imperial age (4%). The bare percentage conceals the fact that their incidence is even higher in the first two centuries of regular epigraphic production, from the end of the fourth to the last decades of the second centuries BCE, especially when Praenestine cippi (which are a strictly local phenomenon) are excluded from the general count. Religion appears to have been crucial in the development of Latin epigraphy from its very beginnings: the largest inscriptions on stone of the first centuries, from the lapis niger cippus (*CIL* I^2, 1) to the altars or bases from Tivoli (*CIL* I^2, 2658) and Corcolle (*CIL* I^2, 2833a; a recently discovered early inscription from Gabii is too poorly preserved to allow for an understanding of its significance; Fortson and Potter 2011), are all understandable as *leges sacrae* or *leges arae*: a type of epigraphic text which is found almost continuously throughout the Republican period and later.

The most outstanding examples of republican age leges sacrae are two almost identical cippi from Spoletium and Trevi (*CIL* I^2, 366 and 2872), a very ancient one from Luceria (*CIL* I^2, 401), the two later but more extensive inscriptions from Furfo and Tarentum, respectively (*CIL* I^2, 756 and 590, first century BCE), and the short but equally significant fragment from Amiternum (*CIL* I^2, 2545).

Leges sacrae very similar to the Roman ones are found also in Republican age inscriptions in other languages of central and southern Italy, like the Oscan *cippus* from Abella, a Volscian inscription on a tiny bronze tablet (originally nailed on some stone monument, maybe an altar) from Velletri or its surroundings, and the largest bronze tablets cited above. A characteristic feature of the most ancient period (fourth/third centuries BCE) are the series of *cippi* dedicated to various gods and inscribed with texts often reduced to the bare theonym. The most famous examples are the four cippi from Tor Tignosa (*CIL* I^2, 2843–6, end of the fourth – beginning of the third century BCE), the 14 from Pisaurum (*CIL* I^2, 368–81, end of the third century), the six from Veii, sanctuary of Macchia Grande (*CIL* I^2, 2628–32, plus one newly discovered inscription; end of the third or second century BCE), and other less preserved series.

It is possible that six small bronze tablets recently come to light (and said to have been found near Posta di Mesa, in southern Latium), bearing simple dedications to gods and goddesses, were originally set on stone bases of the same kind. Simultaneous dedications of groups of altars to one or more gods are well documented from archaeological as well as epigraphical evidence: this is why it is now thought that these stone cippi could best be interpreted as altars.

The use of inscribing votive texts on small bronze tablets is relatively common between the third and second centuries BCE, in Rome (see, e.g., *CIL* I^2, 34, 361, 973, 2675b–c, 2991), Latium (*CIL* I^2, 40, 42, 47, 60, 359–62, 2864, 2847) and other regions (*CIL* I^2, 364, 383, 385, 397, 2764, 2874). Equally almost confined to the period before the first century BCE are votive inscriptions on bronze vases, statuettes, or implements of various types, an epigraphic tradition shared with other cultures of Italy, especially the Etruscan one. It is probably no accident that some of the most ancient Latin inscriptions from outside Latium belong to this type, from the much discussed dedication by the soldier Caso Cantovio (on a

plaque cut out from a bronze belt and found in the area of the Lake Fucino, *CIL* I^2, 5) to *CIL* I^2, 580, said to have been found at Cortona, and 546, from Volsinii (a cosmopolitan city, which attracted significant numbers of immigrants after its refoundation in a new locality, specially chosen for its unique position across crucial communication routes, following the destruction of the ancient Volsinii by the Roman army in 264 BCE).

It is certainly of some interest that the votive inscription from Capena *CIL* I^2, 2435 (cf. *AE* 2008, 520), on a late third-century bronze oinochoe, was actually found inside a tomb: a circumstance unparalleled in Latin epigraphy (it has been supposed that the vase had been originally dedicated in the nearby sanctuary of Lucus Feroniae, pillaged by Carthaginian troops in 211 BCE) but well known in the Etruscan one. Etruscan epigraphic habit did survive Latinization, as is clearly shown by some oddities, like the inscription on a bronze tablet from a Volsinian tomb reporting a gift between individuals (*CIL* I^2, 1998). One of the latest instances of a dedication inscribed directly on a bronze object is found on the so-called Magdalensberg youth (actually, a life-size statue dated into the first half of the first century BCE: *CIL* I^2, 3467), a lavish gift to a deity identified only through its initial letter (*M*) by a group comprising one slave, three freedmen, and one noncitizen: a unique association, probably connected with the exploitation of the iron mines of the area (the Noricum, at that time an independent kingdom allied with the Roman state) and with trade between that region and Aquileia.

From the second century onwards, votive texts are inscribed almost only on stone: most usually altars, bases (which could emphasize the gift placed upon themselves or refer either to immaterial gifts such as public meals, ceremonies, sums of money, or construction or restoration activities paid for by the dedicant), and architectonical elements (columns, lintels, etc.). Dedicatory inscriptions on mosaic floors of temples and cult places form a small but conspicuous group belonging in these same centuries.

About one third of the c. 600 Republican period votive inscriptions so far known to us refer to the dedication of architectonical structures (temples, altars, columns, etc.) or furnishings (statues, bases, thesauri, etc.) in temples and sanctuaries: this is a consequence of the intermingling of this category with the following one, typical of the period after c. 200 BCE.

Inscriptions Recording Acts of Munificence

These inscriptions are one of the most characteristic features of Roman epigraphy, their number following the increased level of competition of the later republic: while only about 10% of the evidence refers to the third century, 40% belongs into the II and about 50% to the first six decades of the first century BCE. About 400 texts, out of the total number of slightly more than 500, record explicitly what had been done by the benefactor(s) – or, alternatively, the object(s) of their action can be deduced by other, material aspects of the inscriptions themselves (e.g., statue bases, lintels, columns).

Although stemming from the Hellenistic tradition of euergetism, Roman-style munificence was conspicuously different, as people involved were mostly magistrates of the central or local governments; private individuals appear later (and in a far lesser scale until the imperial age), often as members or representatives of associations, the most of them involved in cultural practices. Little more than half of the acts of munificence were constructions or restorations of temples or other buildings devoted to cult activities or dedications of statues, altars, or other furnishings or implements inside sanctuaries: this can hardly be a surprise, since pious foundations and dedications were for many centuries the only way to bypass the severe restrictions Roman law and custom imposed on personal propaganda.

This behavior imposes itself especially after the Second Punic War, as a consequence of the increased number of individuals struggling for public visibility; the few oldest inscriptions belonging into this wider category seem in fact more concerned with other kinds of public works. The most ancient one is possibly *CIL* I^2, 1710, recording the construction of the city walls of the colony of Luceria by (at least) three praefects; unfortunately, the inscription itself is lost, and its dating at precisely the time of the colonial

foundation (315/4 BCE) cannot be taken for granted; around the middle of the third century, it is dated *CIL* I^2, 3152, from Paestum, the first of a series of inscriptions commemorating some of the works which reshaped the ancient Greek (and later Lucanian) city into a Roman one (actually, a Latin colony since 273 BCE).

CIL I^2, 2836, referring to a gift by the consul M. Fulvius Flaccus in the sanctuary of Fortuna and Mater Matuta in Rome's Forum Boarium after the capture of Volsinii (264 BCE) is the first epigraphical evidence of the well-documented Roman custom of offering to the gods a share of the booty, either as such (e.g., statues) or by employing the money resulting from the sale of the plundered goods. Later examples of this practice abound, the perceived recipients of the munificence acts shifting gradually from the gods to the citizens attending sanctuaries, until an outright public space (e.g., the forum) was finally preferred for display of booty.

The increasing scale of Rome's wars and the wider participation of allies promoted an equally wider circulation of dedications from war booty by Roman commanders; the most striking example is the series set up by Lucius Mummius after the siege of Corinth in 146 BCE, which encompassed the city of Rome, other communities of Roman citizens, and even allied communities (*CIL* I^2 626–30, plus an inscription in Oscan language from Pompeii). Even if Mummius cared for his dedications throughout the Romano/Italic world as a censor, in 142 BCE, in all inscriptions, he appears as consul. Censors, though formally in charge of the most important public works, are conspicuously absent from inscriptions recording acts of munificence. Magistrates of any level, from the consuls in Rome to the lesser, local *magistri vici*, form by far the greatest part of the donors; priests are equally well documented.

Private individuals are far less common; the presence of women is limited only to the latest period, and some of them (like the *Octavia M. f. Gamalai* [sc. *uxor*] of *CIL* I^2, 3025, from Ostia) owe their role to a particularly prominent position of their husbands or families. Freedmen and male slaves appear most commonly as members of religious associations (while, at present, freedwomen and female slaves are never attested as donors) and only very rarely can act as individuals: one particularly striking example is the Faustus Versenni P. s(ervus) who concluded his dedication of a temple to Priapus (*CIL* I^2, 3391) with the astonishing formula *d(e) s(uo) pecul(io) f (aciendum) c(uravit)*, directly borrowed from the monumental dedications of public works by prominent magnates, who never missed to remember readers that they paid for them from their own pocket (*de sua pecunia*).

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Funerary Inscriptions

Apart from the Praenestine *cippi* and other sparse evidence from outside Rome (e.g., Tusculum: *CIL* I^2, 50–8, 2848–54), the only Latin funerary inscriptions so far known belonging to the period up to the very end of the second century BCE are the epitaphs from the two tombs of the Cornelii Scipiones at Rome (*CIL* I^2, 6–16, 2660, p. 718, 739, 831, 859–60; *CIL* I^2, 2834–5). These tombs are in many ways exceptional, in their architectural setting, in the shape of the sarcophagi within them, and in the inscriptions carved on their front sides and lids. Some of these inscriptions are limited to the bare name of the deceased, but the most famous ones are the large poetic texts reporting the deeds of the most prominent men deposed into the larger of the two tombs and conveniently referred to as *elogia Scipionum*. In fact, given the lack of any tradition in Latin funerary epigraphy, these inscriptions (probably carved all at the same time, some decades after the death of some of the personalities involved) were conceived like public elogia.

Some elements in the name formulae are also very similar to the ones sometimes employed in magniloquent funerary inscriptions celebrating contemporary Etruscan aristocrats. Roman tombs of the early and middle Republican periods were usually simple pits or trenches, sometimes containing sarcophagi or cinerary urns; the less common chamber tombs, probably owned by the most prominent families, could sometimes be decorated by paintings: anyway, every kind of decoration was limited to the interior of the tomb itself. We do not know what kind of markers were put on the ground to signal the existence of these tombs, but they should not have

had a monumental appearance, since no traces of them survive. There should be no surprise, therefore, that funerary epigraphy emerges in connection with a wide reception of east-Mediterranean funerary monuments in the late second century BCE (in Campania, where these architectural types appeared earlier, slightly older Latin funerary inscriptions are known, e.g., *CIL* I^2, 2874b, from Cales).

In the same decades, land plots surrounded by walls and employed for underground burials (ash urns, *fossa* tombs, etc.) began to be marked by inscribed *cippi* with the name of the families who owned them. In some regions of Italy (most notably, in northeastern Etruria) some local forms of funerary epigraphic culture persisted until the early Imperial period; it is actually thanks to the huge number of funerary inscriptions from Chiusi and Perugia (which follow the local tradition requiring an extensive use of epitaphs, especially on cinerary urns) that Etruria boasts one the largest Latin epigraphic corpora in Italy in the second and first centuries BCE (almost 500 inscriptions, about the same number as in Latium – with the exclusion of the approximately 750 inscriptions from the city of Rome, sharply outdistancing all other regions).

Instrumentum

This category encompasses all inscriptions put on objects of current use in everyday life, like vases, pottery or metal implements, bricks, and tiles; it can be broadly divided into two subcategories: inscriptions directly related with production or trade of goods (e.g., stamps on pottery, amphorae, and tiles) and graffiti scratched on these objects, often referring to their owners.

The latter may be interesting for the reconstruction of a vulgar language; the former, on the contrary, can provide plentiful information about production and trade of many goods. The most ancient stamps appear on black-gloss vases; some workshops from Cales producing a unique series of relief-decorated vases, signed them with unconcealed proud. Stamps disappear when, in the second century BCE, mass production of black-gloss wares leads to a significant decrease in their quality; they will only reappear later. The most significant series of stamps of the Republican period is that found on amphorae; their huge number (several hundred, mostly dated from the late second century onwards) and diffusion give an insight in the world of production and trade of common goods, like wine and olive oil.

Names of slaves appearing on stamps provide plentiful information about the organization of kilns; names of landowners, traders, and entrepreneurs on stamps and other categories of inscriptions on amphorae (the so-called *tituli picti*, painted on the neck and shoulder, or the stamps on pozzolana seals) allow to reconstruct a complex network of relations between landed aristocracy, long-distance traders, and kiln owners. Some kilns are involved at the same time in amphorae, brick and tile production. In international perspectives, Latin epigraphy is a consistently international field of research; this is especially true for Republican period epigraphy, whose diffusion, limited almost entirely to Italy, does not allow the regional studies typical of the evidence from the Imperial period. There are no significant discrepancies in methodological approach between scholars from different countries; the only (lesser) distinction between Italian and non-Italian studies can be recognized in the focus on the archaeological and topographical context of inscriptions, for Italian scholars are often more directly involved in discoveries in the field or in specific studies about history of single ancient towns, but the overall approaches are consistent all over the world.

Future Directions

The 1990s have witnessed a renewal of interest about Republican Latin inscriptions; the state of knowledge in this field of study has changed significantly. The last decade has been devoted mostly to studies aimed at refining chronologically, geographically, or thematically defined topics, and at present, it is highly likely that this will be the case for at least the next few years.

Cross-References

- ▶ Epigraphy, Greek
- ▶ Epigraphy, Imperial Latin

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Epigraphy: The Palaeohispanic Languages

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Introduction

At least four writing systems, in addition to the Phoenician, Greek, and Latin ones, were used between the fifth century BCE and the first century CE to write the indigenous languages of the Iberian Peninsula (collectively known as the Palaeohispanic languages): Tartessian, Iberian, Celtiberian, and Lusitanian. In total over 3000 inscriptions are preserved in what is certainly the largest corpus of epigraphic expression in the western Mediterranean world with the exception of the Italian peninsula.

Our knowledge of these languages remains unequal. In some cases, as with Tartessian, the writing system is not yet decoded, which makes it impossible to determine the linguistic family to which it belongs. In other cases, our knowledge of the writing system is much greater – as with Celtiberian – or even total, as in the case of Lusitanian, a language that uses the Latin alphabet, and, since the language belongs to a Celtic branch of Indo-European, it can be studied with the tools and techniques of comparative linguistics. Iberian stands somewhere between these two extremes. As a language, it is non-Indo-European and typologically agglutinative (for Indo-European and non-Indo-European languages in Hispania, see Villar 2000). Our knowledge of Iberian has increased substantially in recent years, but the

language still remains largely undeciphered. To all this should be added the fact that, for an extensive part of the Iberian Peninsula, there is no other evidence than the place- and personal-name elements recorded in indirect sources. Described in this way, the situation might appear disappointing. Yet, in the last few decades, there have been modest but unquestionable advances that enable us to understand somewhat better the uses to which writing was put among the different peoples inhabiting the pre-Roman Iberian Peninsula.

The study and understanding of these languages is essential to achieve a better appreciation of the social, economic, and cultural history of Hispania and the ancient western Mediterranean. They are also key to our comprehension of colonial Phoenician and Greek literacy, which lies at the root of the spread of these languages, and also of the diffusion of Roman literacy, which played an important role in the final expansion of what are known as the Palaeohispanic languages.

Definition

Strictly speaking, the Palaeohispanic languages were those spoken between the fifth century BCE and the first century CE in what today are the territories of Spain and Portugal. In the widest sense, however, Phoenician and Greek should also be included among the Palaeohispanic languages, as they were spoken by colonists born in Hispania between the ninth and sixth centuries BCE. Therefore, no fewer than six varieties of epichoric signaries and several adaptations of the Greek and Latin alphabets make up the complex mosaic of scripts and languages recorded in the Iberian Peninsula. In standard usage, however, the term is only applied to the languages that were not spoken outside Hispania, an area in southern France that extends from the River Hérault toward the west – culturally inseparable from Spain in Antiquity and where the northeastern Iberian script is predominant – being included for practical and historical reasons as part of this definition. It is important to bear in mind that there is no absolute correspondence between the Palaeohispanic languages and the scripts that these languages used over time, since the latter originated in the Iberian Peninsula itself although in response to external stimuli.

Today, when we speak of Palaeohispanic studies, most scholars understand or refer to the study of the languages and writing systems used in ancient Hispania prior to the generalization of Latin. Therefore, this is a well-established academic field in which several disciplines play a fundamental role; the subject deals with a complex range of cultural contexts covering an extensive geographical area as well as a huge chronological scope, almost a millennium of history. Despite that, the academic field of Palaeohispanic studies is a recent one, and it is convenient to have some idea of its development as a discipline if we aim to understand what Palaeohispanic studies really are.

Historical Background

Even though the field of Palaeohispanic studies is a discipline that has developed relatively recently, it nevertheless can trace its origins and roots back to the Renaissance. Two main lines of research have contributed to creating the modern field of Palaeohispanic studies. On the one hand, humanists and numismatists have long been concerned with and interested in collecting and cataloguing ancient coins. In Spain, however, some of these coins were written in an incomprehensible script and swiftly provoked great interest (for the coins using Palaeohispanic languages, see Ripollès and Sinner 2019). As a consequence, a line of research that aimed to decipher these coin legends started to develop. On the other hand, classicists interested in the study of Greek and Latin texts as well as Latin epigraphy aimed to achieve a greater understanding of and to reconstruct the ancient history of Hispania. To do so, they retrieved substantial amounts of information concerning different peoples and cultures, including in many cases native onomastics and linguistic information (De Hoz 2019 with bibliography).

From the sixteenth century onward, when Antonio Agustín first identified some syllabograms, but especially during the eighteenth and nineteenth centuries, when numismatists catalogued, translated, and tried to assign values to those

incomprehensible signs, a greater understanding of the script was increasingly sought. During this long process, both pioneering scientific ideas that had never been applied to the subject before – such as the importance of a Celtic stratum in the linguistic panorama of Hispania – and also highly speculative theories, in many cases unfounded, such as the Vasco-Iberian theory, a belief in the linguistic unity of ancient pre-Roman Spain, where a language that was the ancestor of modern-day Basque was thought to have been spoken, were developed; these were extremely influential both inside and outside Spain.

It was not until 1920 that there was a noticeable change in the situation thanks to the contributions of Gómez-Moreno. He first conceived and fully developed the idea of a semi-syllabic script in which the representation of stop consonants was always accompanied by a vowel (<da>, <de>, <di>, <do>, <du>, etc.). This was a groundbreaking thesis and led to the relationship long desired by Spanish numismatists between the coin legends written in Iberian script and their equivalent Latin forms being established. For most scholars, Gómez-Moreno's work marked the beginning of modern Palaeohispanic studies since, after his decipherment of the alphabet, it was possible to distinguish more than one language (Iberian and Celtiberian) in the epigraphic corpus.

Initially the field of Palaeohispanic studies was a regional field of limited impact outside the Iberian Peninsula. It was only thanks to A. Tovar's linguistic works and J. Untermann's epigraphic corpus (1975–2001) that Palaeohispanic studies truly started to flourish. Unfortunately, Untermann's death prevented the publication of his *Supplementa*, including all the recently appeared inscriptions. All these data are now collected, including those in *MLH*, in the Hesperia database (*BDHesp*), which is an ongoing project and certainly one of the future pillars for Palaeohispanic studies.

Key Issues/Current Debates

In the field of Palaeohispanic studies, there are currently many unresolved debates, and positions are sometimes remarkably disparate. For this reason, in the following lines we have tried to be meticulous when expounding the state of the question in each area of study. The aim is to make clear the difference between those hypotheses that can count on broad acceptance and those that are still currently under evaluation and debate.

The Earliest Indications of Epigraphy

Writing is not a locally born phenomenon in the Iberian Peninsula, but rather it is closely linked to the presence of Phoenician and Greek epigraphic cultures (for a linguistic history of the Iberian Peninsula in antiquity, see De Hoz 2010, 2011). Both groups introduced certain uses of writing through their colonial settlements, uses that served as a stimulus and in many cases as models for the native populations. Bearing this in mind, it is not surprising that the first manifestations of writing in the Iberian Peninsula occurred precisely around those places where Greeks and Phoenicians had a more stable presence. As early as the late eighth century BCE (or perhaps the early seventh century BCE), the impact of Greek and Phoenician culture can be demonstrated in southern Andalusia by the finding of scratched graffiti on pottery vessels in both languages (Zamora 2019 with bibliography). Actually, it is the coexistence of these two scripts that seems to have created a suitable background for the birth of the first epichoric script to be recorded in Iberia. The scarcity of recorded examples, however, does not affect its significance, which lies in the fact that all the other Palaeohispanic scripts that were used in the Iberian Peninsula were derived from this initial script (Ferrer and Moncunill 2019). Most of its signs are morphologically similar to those of the Phoenician alphabet. In addition to that, in the two inscriptions reproducing a complete or incomplete signary (Espanca and Villasviejas del Tamuja), the order of the first signs coincides exactly with those of the Phoenician alphabet, thus proving that the latter was the model used for the elaboration of the first Palaeohispanic writing system. In all probability, this early writing system was not conceived to scratch the few modest graffiti on pottery sherds that have come down to us; its main use should be related to the intense trading activity that is well documented in this region. Nevertheless, due to the limitations of our current sample, any hypothesis formulated cannot be considered other than mere speculation.

Epigraphy in the Southwest

A region in the Algarve (Portugal) adapted the early Palaeohispanic script during the seventh century BCE. About a hundred inscriptions on stone, probably funerary steles (Fig. 1), have been discovered in this area. Most of them are undecorated, but a few show a schematic figure, possibly a heroic warrior. These monuments may belong to a tradition of Bronze Age origin of which ample proof has been found in Alentejo and Extremadura. Recently found Phoenician steles from Lisbon datable to the eighth century BCE could also have been used as models. Apart from the steles, only some graffiti, probably personal names, on pottery vessels are known. The possibility of attributing a votive function to the signary from Villasviejas de Tamuja, recently reinterpreted as an *ostrakon*, cannot be discarded.

The majority of the texts are written from right to left, at times adopting a spiral layout following the edges of the pottery sherd. This writing is known as the southwestern, south Lusitanian, or Tartessian script (Correa and Guerra 2019 with bibliography). It is a semi-syllabary in which each vowel and continuous consonant is attributed a graphic symbol, as in alphabets, with stop consonants being indicated in a syllabic form, as in syllabaries. This characteristic was to become a shared property of all Palaeohispanic writing systems, an especially relevant aspect when it is taken into account that the main model for the script's creation was the Phoenician alphabet. In addition, the southwestern system has another specific characteristic: each stop syllabogram is followed by a vowel for the same sound, ta^a, te^e, ti^i, etc., an unnecessary procedure, redundancy, normally accepted as proof that the script had indeed not been created for writing the language in question. Regrettably, the degree of decipherment is not as advanced as might be desirable. At present, there is no consensus among specialists regarding the value of many signs. In addition, most texts are written in *scriptio continua*, with the resulting difficulty in dividing the texts into words. Therefore, the southwestern language remains undeciphered. The proposal that this southwestern language should be considered a Celtic language has not been accepted among specialists, who are mostly still skeptical about its typology and possible relationships. In chronological terms, the dating of the southwestern inscriptions is very complex, especially since a great number of steles

Epigraphy: The Palaeohispanic Languages, Fig. 1 The stele from Mesas do Castelinho. (Photograph: A. Guerra)

have been found in reused contexts. Despite these difficulties, most scholars would agree that this particular outburst of inscription production and its disappearance may have taken place in the second half of the seventh century BCE, and no subsequent written culture has been found in the area. The next inscriptions to be engraved were Roman and must be dated to the late republican period.

Iberian Epigraphy

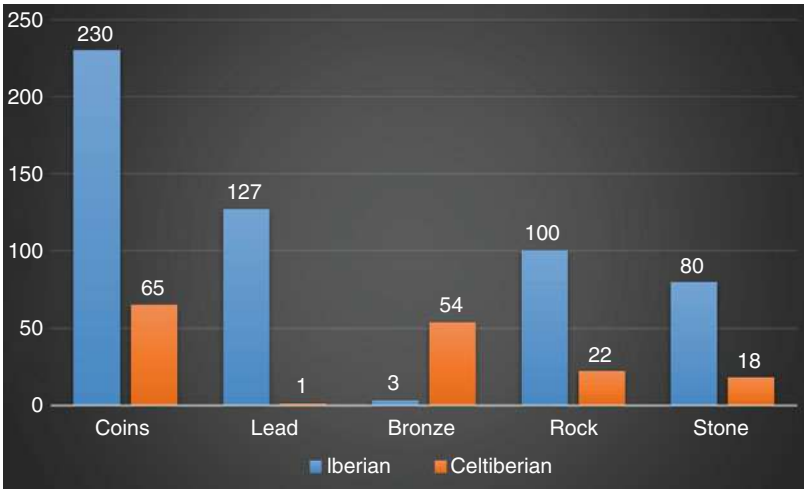
The Iberian language (Moncunill and Velaza 2017; Velaza 2019 with bibliography) is doubtless the best attested among all the Palaeohispanic languages. More than 2200 inscriptions can be located in a wide geographical area between Roussillon (France), coexisting there with the Gallic language, and Andalusia. Its chronological framework covers from the fifth century BCE until a moment of time after the reign of Augustus. The acquisition of writing by the Iberians can be considered a consequence of their contact with the Greek colonies in southern France and northeastern Spain. The earliest securely dated examples are graffiti on Attic pottery found in the excavations carried out at the *oppidum* of Ullastret (Girona). From this same period, inscriptions have also been found on lead tablets (Fig. 2), similar to those from Pech Maho or Ampurias, and in which Iberian names appear as participants in trade transactions. Nevertheless, the Iberian language remains essentially undeciphered, a handicap that makes it difficult to achieve a good understanding of these texts. Despite this problem, the Iberian lead tablets of this initial period basically seem to contain texts related to commercial activities and the distribution of goods. Stamps on *dolia* or amphorae can also be found, proving the use of epigraphy in productive activities. In short, the earlier Iberian inscriptions, between fifth and third centuries BCE, can mainly be categorized as colonial epigraphy. There were still no funerary inscriptions in this period. The cemeteries known exhibit iconographic forms of ancient tradition or oriental influence (via southern Spain) and, more than anything else, funerary steles without inscriptions (Ensérune). By the middle of the third century, the introduction of the epigraphic habit seems to have been extended into the religious sphere. The use of writing is gradually adopted in the rock-face sanctuaries in Cerdanya (Campmajó and Ferrer 2010), and writing seems to be an important aspect of ritual with the signary as a votive element. Painted Iberian pottery was produced around the same time, in which ritual was mixed with ethnic and elite self-representation, and writing played a leading role. During the second century BCE, a far-reaching change occurred in Iberian epigraphic culture as a consequence of the Roman presence. With the influence of Roman public writing models, new categories of epigraphy and inscriptions on

Epigraphy: The Palaeohispanic Languages, Fig. 2 Lead sheet from Tivissa. (Photograph: D. Asensio)

different materials appear, as well as the development of carving techniques and the use of new palaeographic forms and formulae. At this moment tomb inscriptions started to be engraved. In the first instance, the epigraphic language coexisted with the iconographic language, subsequently giving way to a gradual disappearance of decoration in favor of textual predominance. Votive inscriptions mainly associated with rock faces became sanctuary epigraphy at a time when sacred spaces were monumentalized. Perhaps the best example of these practices can be seen at the sanctuary of *Liber Pater* in Muntanya Frontera. A form of Iberian epigraphy that can be described as public emerged. Some inscriptions interpreted as honorific or monumental appear at this moment, especially in the forum or public buildings, as in *Emporiae, Tarraco* or *Saguntum*, showing the clear influence of contemporary Roman epigraphic habits. In the ambit of public and civic epigraphy, mention must be made of Iberian coin inscriptions. While the earliest examples can be dated to the end of the third century BCE, the peak of the phenomenon took place in the second century BCE and lasted until well into the first century BCE. In the same way, in some specific places like *Saguntum*, the continued use of Iberian writing into the imperial period must have arisen from a desire to maintain the features of an ancient epigraphic tradition as part of a civic or elite identity. To summarize, the history of Iberian written culture, from a diachronic perspective, can be understood as a process of expansion that starts with colonial epigraphy in the fifth-third centuries BCE and develops into a more extended written culture, with extensive public and private use of writing in the second-first centuries BCE. The enormous quantity and variety of materials that were inscribed, as well as the broad time span for which evidence is available, suggest a more socially widespread use of writing than scholars are often willing to accept. The fact that several writing systems were used to write the Iberian language seems to reinforce this conclusion. The northeastern semi-syllabary and the southeastern script (Ferrer and Moncunill 2019) are derived from or descendants of the ancient Palaeohispanic script, but they suppose a new adaptation with special features. What is known as the Greco-Iberian script is indeed an alphabet adapted around the fourth century BCE from Ionic Greek. In fact, Greek and Latin characters were also used to write texts in Iberian, but to a far lesser extent. Such a wide variety of graphic systems seems to reflect a plurality of needs and writing traditions rather than the supposedly limited literacy usually attributed to the Iberian world, where in many cases writing has been restricted to an elite.

Celtiberian Epigraphy

As ancient historians clearly state, the Celtiberians were peoples composed by different tribal groupings, such as the Arevaci, Lusones, Belli, and Titii, that inhabited an area of the central Meseta and the Ebro valley. The language they spoke and wrote, however, was a variety of Peninsular Celtic, also shared by other neighboring peoples, for instance, the Berones and Carpetani. Therefore, when Celtiberian epigraphy is mentioned, reference is not being made to the tribal name or ethnic grouping, but to broader linguistic criteria (Beltrán and Jordán 2016, 2019). Despite being a geographical neighbor of the Iberian culture and obviously interrelated with it in many aspects, Celtiberian epigraphy displays a very different character, function, and development when compared with the former. A quick look at a chart comparing Iberian and Celtiberian epigraphy (Fig. 3) allows us to appreciate the quantitative differences that exist between them, which doubtlessly reflect the gap in territorial distribution and chronological time span. In addition to that, differences regarding the penetration of literacy and, especially, a significant divergence as concerns the most commonly used material supports and epigraphic functions can also be detected. As mentioned above, in the Iberian sphere, there are many inscriptions on lead plaques and tablets, often reflecting commercial transactions or curses, but in the Celtiberian area we only know one single letter on lead, which comes from a site located in the epigraphic frontier region with the Iberian epigraphic area. While the Iberians made little use of bronze as a material support, in contrast the Celtiberians made much greater use of it



Epigraphy: The Palaeohispanic Languages, Fig. 3 Chart comparing Iberian and Celtiberian epigraphy

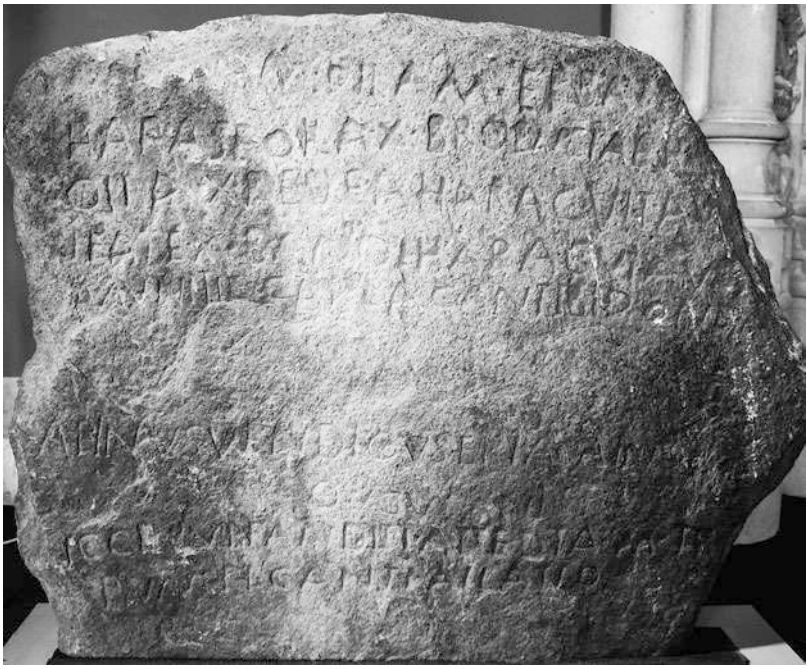
and in different contexts. How and why the Celtiberians adopted writing is a question that remains unanswered. Only a few years ago, scholars would have agreed that this process took place as a consequence of the Roman arrival in the Peninsula. Recent research, however, together with our current knowledge of the scripts, encourages us to think that the Celtiberians most probably started writing before that date, although perhaps not long before. Therefore, around the mid-third century BCE, the Celtiberians adapted two variants of the Iberian script in order to write their language, a practice that lasted until about the change of the era. From the first century CE on, Latin characters were introduced into the Celtiberian writing system with a few small adaptations, for example, the adding of an extra stroke to the S, indicating the second sibilant in Celtiberian. This procedure cannot be understood as a localized palaeographic feature since it is documented in both the rock face and bronze inscriptions. With the currently available evidence, it is possible to say that the Celtiberian epigraphic culture was largely inspired by Roman inscriptions (Beltrán and Jordán 2008). This phenomenon is particularly obvious for the more than 30 *tesserae hospitales* on bronze, which exhibit numerous parallels with comparable Latin examples. Their morphology is diverse, but they can basically be classified in three groups: the hand-shaped ones, those in the form of animals, and those of geometrical shape. The bronze plaques are also of clear Roman influence. Some are medium-sized, but there are also others of much larger sizes, like the large bronze plaques from Botorrita (Fig. 4), for which there are Latin parallels from the same site. Our current knowledge of the Celtiberian language is fragmentary and therefore too poor to fully understand these large inscriptions. In many cases, it is difficult for scholars to agree on basic aspects of the text, such as the type of message they contain. Despite all these difficulties, in some cases we have quite reliable indications that their contents were of juridical nature and that they were probably issued by municipal authorities. This would be a shared characteristic between the bronze plaques and coin issues, another epigraphic category among the Celtiberians with no less than 47 known mints. Beside these categories of inscriptions, the Celtiberians seem to have used others as well. Funerary epigraphy is little represented in the corpus, perhaps due to its merely sporadic use although it is documented in some of the steles of local tradition found in cities like Clunia. Surely the reason why votive or religious epigraphy, beyond the scratched graffiti in the rock face sanctuaries like Peñalba de Villastar, failed to develop was the lack of monumental cult spaces in the Celtiberian world until well into the Roman period. Chronologically speaking, Celtiberian texts were written in Latin characters at Peñalba

Epigraphy: The Palaeohispanic Languages, Fig. 4 First bronze from Contrebia Belaisca (Botorrita, Zaragoza). (Photograph: Museo de Zaragoza)

de Villastar at a time that was contemporary with or slightly earlier than Virgil's verses, in what we should perhaps consider to have been the final expression of the native epigraphy of Celtiberia.

Lusitanian Epigraphy

The Lusitanian epigraphic corpus is composed of a total of six, possibly seven, inscriptions in Latin characters (Fig. 5) (Luján 2019 with bibliography), distributed in a small area in modern-day Portugal and Extremadura. It seems clear, however, that the linguistic territory where the Lusitanian language was used was much larger than the area suggested by these six inscriptions and should be extended to the rest of the Roman province of Lusitania and perhaps to part of *Gallaecia*, as indicated by the frequency of personal names and theonyms in Roman inscriptions (Vallejo 2016). The inscriptions in this limited corpus share certain common features. All use Latin characters, without introducing variations to fit the particular features of the language. All the texts are of religious content, related, as far as we are able to understand them, to rituals (involving animals) dedicated to certain gods. Furthermore, two of the inscriptions share another particular feature: the Lusitanian part of the text is headed by two brief sentences in Latin. These phrases indicate who the authors of the inscriptions were by using the formula *Ambatus scripsi* and *Rufus et Tiro scripserunt*. In short, all of them reflect the wish to monumentalize a rock-face sanctuary and therefore may be, to a certain extent, considered official epigraphic documents. The absolute lack of other inscriptions in Lusitanian would point toward a very limited epigraphic phenomenon, if it were not for the dating of the inscriptions. Traditionally, scholars have dated this corpus to the first and even second century CE. The appearance of the inscriptions from Arronches and Arroyo de la Luz III, however, introduced an additional palaeographic variable that could change this chronology: the archaic form of the P and linguistic arguments. The panorama of Lusitanian epigraphic culture would become more complicated if these inscriptions really should be dated to the republican period. If this were the case, the six inscriptions, despite being homogeneous in form and content, would nevertheless be spread over the time span of two



Epigraphy: The Palaeohispanic Languages, Fig. 5 Lusitanian inscription from Arronches, Assunção

centuries or more. Perhaps palaeography cannot be our only argument in this case, as we might be facing the survival of an alphabet with archaizing features. With all the evidence currently available, the most feasible scenario is one in which the Lusitanians did not record their language in a written form prior to the Roman period. Therefore, the Lusitanians never developed a true epigraphic culture, not even as a consequence of the implantation of Latin epigraphic models. The written form was used for texts only on an occasional basis, and within a ritual context. Whether the texts were in some way stereotyped before being carved and whether all of them belonged to a limited time span or were spread out in time are aspects that will still have to be elucidated in the future.

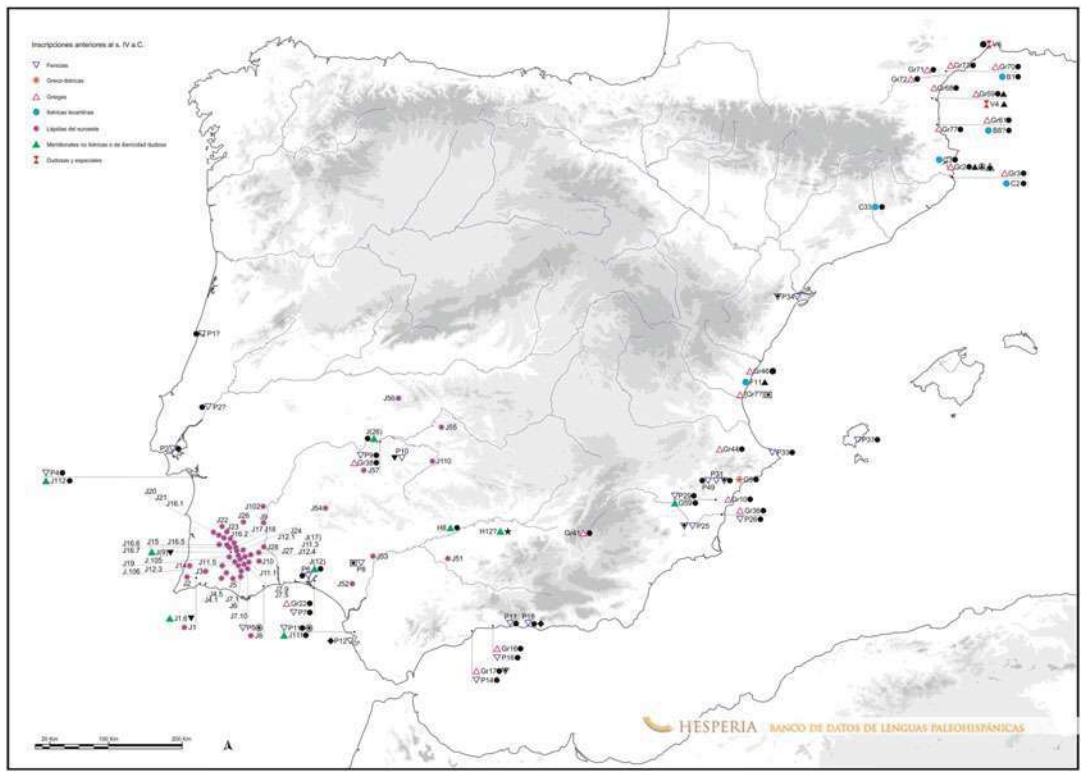
Vascon Epigraphy?

The Vascones were a group of peoples who, based on what is known from the ancient sources and the archaeological record, inhabited the modern territories of Navarre with some inroads into modern La Rioja (*Calagorri*, *Graccurri*) and Aragón (*Segia*, *Iaca*). Until a few years ago, the Vascones were considered to be an anepigraphic culture (for the territories of Hispania without epigraphy, see Gorrochategui and Vallejo 2019). However, today the situation is slightly different, and some of their cities are known to have issued coinage with legends in a script that is undoubtedly related to the Iberian script but which includes a particular set of graphic elements that can set this script apart. Some of these signs are completely unknown in any other Palaeohispanic script, mostly perhaps being imitations of Latin characters, and others are only rarely documented in the Iberian script. In general, these texts are exclusively known thanks to the survival of a small number of coins, which does not mean that some of these issues were not substantial or significant at their time (as is shown by the fact that imitations from Belgic Gaul are known). In addition to the public and civic nature of these epigraphic documents, other finds can help us to contemplate a more widespread use of writing among the Vascones: the most important of all is the inscription on the *opus signinum* pavement from *Andelo.* Although there is some controversy around this particular document – some scholars consider the text to be written using the Iberian language – there is a degree of consensus that the text uses

the Celtiberian script to write what could be an ancient form of Basque, the vernacular language in the region (for ancient languages in the Pyrenees, see Gorrochategui 1995 with bibliography). In addition to this extraordinary document, a new inscription engraved on stone from Olite and some graffiti using the Palaeohispanic script recovered in the territory of modern Pamplona should be added, completing what today is a very small corpus of inscriptions. Based on all this evidence, it seems obvious the Vascones undertook, around the mid-second century BCE, some writing experiments. To do so, sometimes they used the Celtiberian script, while on other occasions they adapted the Iberian one. It seems clear, however, that as in the case of the Lusitanians, they never developed a true epigraphic culture. An interesting difference between the Vascones and other groups discussed in this text (such as the Celtiberians) is that the former seem to have suffered "truncated epigraphization" as a consequence of Roman cultural influence. Such a phenomenon shows that in some cases Roman influence could stimulate local epigraphic habits, as in the case of the Celtiberians, while in others, the generalized use of Latin was able to eradicate early forms of local epigraphic expressions, as happened with the Vascones.

Conclusions

Maps can accurately synthesize the evolution of writing in the Iberian Peninsula between the fifth and the first centuries BCE. Inscriptions prior to the fourth century BCE follow a very clear pattern distributed in a coastal strip defined by the leading Greek and Phoenician colonies and their limited areas of influence. This pattern can be completed by the addition of the few southwestern inscriptions, which can be traced along the Rivers Guadiana and Guadalquivir (Fig. 6). A very different



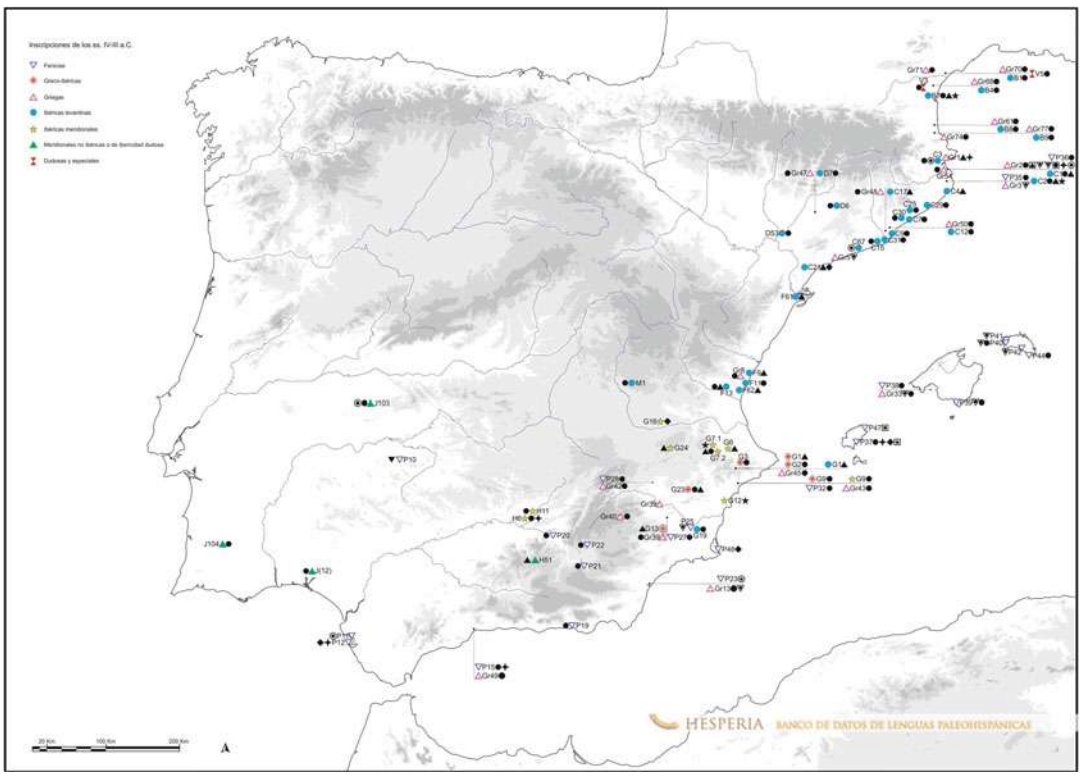
Epigraphy: The Palaeohispanic Languages, Fig. 6 Map including Palaeohispanic inscriptions prior to the fourth century BCE

scenario can be presented by looking at a map including inscriptions from the fourth and third centuries BCE. Here, the southwestern inscriptions disappear, and epigraphic evidence does not reappear until the Roman imperial period (Fig. 7). In contrast, inscriptions in the coastal Mediterranean territories increase in number and show a progressive penetration inland following the River Ebro. A map focusing on inscriptions dated between the second and first centuries BCE – including republican inscription using Latin – (Fig. 8) will immediately be characterized by the density of material in the territories along the Ebro valley and in the modern area of Andalusia. The opposite picture comes from the northwestern quarter of the peninsula, which remains anepigraphic, and its central areas, where the density is still quite low (for the relation between writing and colonization, see Díaz Ariño et al. 2019). This situation, which preludes the disappearance of the native epigraphic cultures to the advantage of Latin, arose around the end of the first century BCE and in the early first century CE, the few Iberian inscriptions after this date being considered residual phenomena.

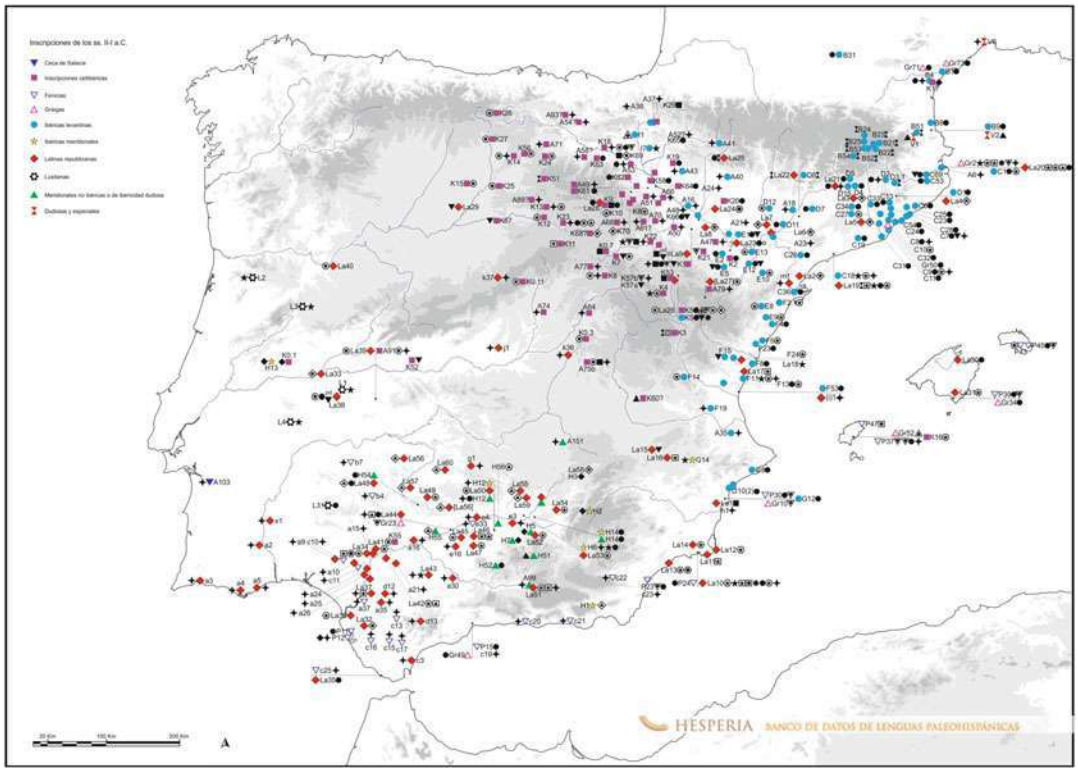
Future Directions

It is difficult to foresee the future directions of a field that depends heavily on uncovering new finds. That said, it is feasible that, as has happened in the last few decades, the lines of research will follow three fundamental directions:

1. The first of these research lines should move toward the consolidation of knowledge of the graphic systems used to write the Palaeohispanic languages. The studies conducted over the last years have renewed this area considerably, demonstrating that there are a greater variety of systems, or



Epigraphy: The Palaeohispanic Languages, Fig. 7 Map including Palaeohispanic inscriptions from the fourth and third centuries BCE



Epigraphy: The Palaeohispanic Languages, Fig. 8 Map including Palaeohispanic and Latin inscriptions from the second and first centuries BCE

subsystems, of writing than was traditionally thought. Nevertheless, there is no consensus among scholars about how many systems existed and how some of their signs should be transcribed.

2. The second line should focus on the detailed study of each of the aforementioned epigraphic corpus, paying special attention to the methodological particularities that each of them imposes. In the case of the Indo-European languages, Celtiberian and Lusitanian, it is necessary to fine-tune the tools of analysis provided by comparative linguistics through the intensification of the internal analysis of the texts and the contribution of external epigraphic parallels. In the case of the non-Indo-European languages, Tartessian and Iberian, the combinatory analysis established by Untermann could be challenged in the future as the most suitable method to approach these languages, thanks to the use of new tools facilitated by innovatory techniques such as segmentation and frequency analysis, but also by the application of paradigms from linguistic typology. In both cases, however, it is fundamental to have an up-to-date open-access epigraphic corpus that is soon going to be available for the first time thanks to the Hesperia project (*BDHesp*). Finally, in the case of the languages for which there is very limited evidence, such as proto-Basque, or in the case of those only attested by onomastics, our reliance on new finds is even more pronounced.
3. The last of the three research lines must be concerned with promoting further in-depth comparative studies between the different Palaeohispanic epigraphic cultures. It is necessary to extend this type of studies into a broader field such as the pre-Roman epigraphies in the ancient Mediterranean. To do so, the AELAW project (Ancient European Languages and Writings) is currently working on a data bank

for the ancient languages and epigraphies in the Mediterranean area that will undoubtedly become the point of reference for multiple future studies.

Cross-References

- ▶ Epigraphy, Greek
- ▶ Epigraphy, Imperial Latin
- ▶ Epigraphy, Latin: Early Through Late Republican

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Erasure of the Past

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Introduction

Functional societies, like functional individuals, engage in a selective winnowing of past events in the creation of their identities. They do this by both remembering and forgetting, partly out of necessity in order to manage an overwhelming amount of information and partly to minimize or

mitigate traumatic experiences. At the group level, this process takes place in two ways: selective editing of the past in the form of preservation of only some parts of the archaeological or textual record (what in German is referred to as "Totschweigen," literally to kill by silencing) and selective destruction of heritage. The preservation of the past is a form of selective editing at several levels – not all sites are chosen for excavation and only a small number of those that are excavated are highlighted in publications, heritage tourism, or museum exhibits, for example – while the destruction of the past literally erases sites or evidence and thereby ensures that it will not be available in physical form for study or symbolic manipulation by potentially hostile interest groups.

Definition

Erasure of the past takes many different forms, but the oldest, best preserved, and most visible is the selective destruction of monuments, cultural artifacts, or inscriptions. This activity may be primarily religious or primarily political in nature; often it is both (Flood 2002: 642; Sauer 2003: 46). In the former case, it is referred to as iconoclasm, defined as the destruction of images, from the Greek eikon (image) + klan (to break); in the latter case, it depends on the context, but the Romans referred to it as "damnatio memoriae," or damning the memory of a person or group by erasing all traces of their names and/or images from public monuments and documents (Sauer 2003). Even in cases where religious motivations can be assumed to have been the primary reason for the destruction, it is not always possible to determine this with certainty. Eberhard Sauer's complex list of criteria for defining particular instances of cultural heritage destruction as religious iconoclasm makes this clear:

1. Exceptionally laborious and thorough modes of destruction without any obvious practical purpose like reuse of stone
2. Cases where pagan images appear to have been targeted but other artwork spared
3. Cases where naked deities were more thoroughly destroyed than their modestly dressed counterparts
4. Temples in which items of value, notably coins or other metal items, were deliberately left behind
5. Iconoclasm in temples which soon thereafter were consecrated as churches or built over by churches (Sauer 2003: 38)

Sauer notes that hostility toward certain kinds of images characterizes all three of the major monotheistic religions (Christianity, Islam, and Judaism), so it is not surprising that acts of destruction focused on religious images of polytheistic traditions constitute a significant percentage of known examples of iconoclasm (2003: 161). Flood points out that the iconoclastic practice of deanimating images by depriving them of a soul often involves rendering them powerless by targeting the parts of the body that were perceived to be the most potent, especially the face and sensory organs (2002: 648). Pollini and Flood both note the apparent contradiction inherent in the mutilation of images belonging to alien religious traditions: by attempting to render such representations harmless, the iconoclasts imbue them with potency (Flood 2002: 647–8; Pollini 2006: 590). Significantly, the toppling and destruction of statues of deposed rulers, an apparently political act, follows virtually identical patterns of mutilation and desecration, further blurring the line between religious and political iconoclasm.

Recent manifestations of erasure of the past include the targeted bombing of culturally significant monuments such as the bridge at Mostar during the Balkan conflict (Cameron 2008) as well as the repatriation and reburial of human remains and cultural artifacts, even though destruction through reburial may be motivated by indigenous groups in contemporary societies for whom it represents a way of regaining control of their past. For the purposes of this definition, motivations are secondary; what matters is that the action permanently removes material traces of past peoples or cultures from future contemplation, study, or manipulation. This may extend to

the representation of past cultures in written form or in museum contexts; what no longer exists cannot be displayed, and by simply not including any mention of a particular group or culture in a national museum, as in the case of the Saami people in some parts of Scandinavia (Levy 2006), they can be effectively erased from the official record. Sauer notes that secular iconoclasm, such as that accompanying the French revolution, used image destruction in order to "break off the people's link with the past" (2003: 162); this is the common denominator in all forms of erasure of the material remains of past traditions, whether through Totschweigen, as in the case of the non-representation of the Saami people in Scandinavian national museums, or through active destruction of culturally significant monuments, as in the case of the Mostar bridge.

Historical Background

Not all examples of the erasure of the past involve active destruction, as the Saami example illustrates. The cooption or transmutation of sites or traditions is a universal phenomenon that is rarely mentioned in discussions of more obviously negative examples of heritage destruction, perhaps because the objects or monuments themselves survive, although in an altered state. Places that are imbued with special significance are often subjected to this kind of successive erasure, as later structures are built on top of earlier ones in order to appropriate the potency of these places. While this phenomenon can be found worldwide, in Europe, it is exemplified by the many Celtic temples that are found under Roman temples which in their turn were built over by early Christian churches in a kind of architectural palimpsest that preserved the significance of the location while largely destroying the physical remains of previous cultural and religious traditions. The recutting of a marble bust of the Emperor Nero into a portrait of Vespasian (Pollini 1984) and the transformation of the church of Hagia Sophia in Christian Constantinople into a mosque in Muslim Istanbul are both examples of this type of transformative repurposing. Other examples involve more permanent destruction, as in the case of the recent erasure of the largest and most important Muslim cemetery in Palestine by the construction of a Museum of Tolerance in Jerusalem, dedicated (rather ironically) to promoting the principles of mutual respect and social responsibility in the face of a "rising crescendo of ethnic tensions" (Makdisi 2010: 519). The message in these otherwise disparate cases is simple and brutal: When it comes to the selective erasure of the past, the agendas of the living invariably trump those of the dead, and those in power decide whose past is preserved or enshrined and whose will be destroyed or denied expression.

The process of transmutation of one past into another occurs in oral and written traditions as well, as exemplified by the repurposing of pagan mythology in northern European fairy tales transcribed and translated by the Brothers Grimm and by the pre-Christian epics of the Irish and Welsh oral traditions that were selectively edited by the monks in their monastic scriptoria. The fictional and pseudo-historical depictions of the English King Richard III as a hunchbacked monster are another example of this phenomenon; Sir Thomas More and Shakespeare between them did such a good job of character assassination on this historical figure that most people are unaware that alternative interpretations exist or that contemporaries would have had a very different impression of this much maligned monarch. All cultures are continually recycling, repurposing, and stitching together fragments of collective memories; physical manifestations of those memories have special significance as mnemonic devices because they are more tangible and have a permanence that makes them valuable in identity politics. This is also why they are often the target of destructive acts that strike at the heart of a group's sense of itself (Adams 1993). More than 2000 people died in the riots following the destruction of the Babri Masjid Mosque in Ayodhya, India, in 1992. Many Hindus believe that the mosque was built in 1528 over the tomb of the god Rama and the archaeological excavations carried out at the site subsequent to the destruction of the mosque became a flash point for Muslims and Hindus with international repercussions (Ratnagar 2004).

Clearly, such sites have a symbolic power that goes well beyond their physical remains.

So why is cultural heritage, especially its material remains, so contested? Sites, monuments, artifacts, and texts are the functional equivalent, at the group level, of individual memory and identity; just as individuals cannot function without memory, group identity is also bound up in the tangible as well as intangible artifacts and expressions of its past. This is why both history and archaeology have been subject to such intense pressure by various interest groups ever since emerging as distinct disciplines, and it is also why it is so important for those fields of research to maintain some degree of political autonomy (Arnold 1999). Archaeology in particular has been the target of political manipulation, by nation-states and other interest groups, largely because it provides a greater time depth than written records and so can be appealed to in claims to territory and/or sovereignty (Arnold 2002).

Acts of erasure in more recent times have occurred under the corrosive combined influences of colonialism and racism. Examples include the case of the North American Mound Builder cultures whose native origins were denied by European colonists until mounting evidence of continuity with living Indian groups led to the official recognition of the construction of impressive sites like Cahokia in Illinois by indigenous peoples (Arnold 2002: 106–7). In the parallel case of Great Zimbabwe, where massive stone enclosures and structures were attributed to non-African groups by the white colonizers of Zimbabwe, virtually all archaeological traces of indigenous African activity at the site were removed in order to preserve the myth of white superiority. As a result, later excavators were left with only trace evidence of the artifacts that once abounded at the site, the capitol city of a vibrant culture that flourished between 1290 and 1450 CE (Hall and Steffof 2006).

Politically and religiously motivated iconoclasm in the ancient world has a long history, from the selective excision of the names and faces of pharaohs such as Akhenaten, also known as the Heretic King, at Amarna in the fourteenth century BCE (Sauer 2003: 46; Varner 2004: 13–4), to the destruction by Greek Christians of idolatrous images on the Parthenon. Roman portrait busts were frequently recut, partly to save on the costs of acquiring new marble but most often to erase the image of an individual who had suffered *damnatio memoriae*; the infamous Roman emperor Nero is a good example (Pollini 1984). Historically, religious hatred and iconoclasm are well documented, from the Puritan destruction of Catholic statues and stained glass windows in seventeenth-century England and Ireland to the bombing of the famous bridge (built by the Turkish engineer Hajrudin for the Ottoman Emperor Süleyman I in 1566) across the Neretva River in Mostar's Stari Grad (Old Town) in 1993 during the war in Bosnia (Adams 1993). The Bosnian conflict was unusual in its relentless and comprehensive targeting of architecture, as if, as Adams eloquently puts it, "the protagonists, unable to strangle the last living representatives of an alien culture. . .think that with the destruction of place, an architectural cleansing, as it were, they can eradicate the people who inhabit that place" (1993: 389). Such destruction casts long shadows, as exemplified by a nineteenth-century headstone in the churchyard of the friary of Murrisk in Co. Mayo, destroyed in the seventeenth century by English Puritans, or "heretics," as a nearby plaque erected in 1942 proclaims. Someone, in a retaliatory act of erasure at least two centuries after the destruction of the friary, chiseled out the name of HRH Queen Victoria on George Patrick O'Malley's headstone, during whose reign he had served in the British Army (Fig. 1a, b). Even such apparently clear-cut examples of destruction and erasure in religious contexts (mosques, churches, temples) are often accompanied by a political or economic subtext, however. For example, while the Babri mosque was being demolished by mobs in 1992, the houses of hundreds of poor Muslim residents of Ayodhya also were destroyed; as Ratnagar notes, we should not overlook the appropriations of real estate, the business rivalries, and the electoral calculations that typically accompany such events (2004: 242).

The destruction in 2001 of two enormous Buddhist statues cut out of the living rock in the

Erasure of the Past, Fig. 1 (**a**) Headstone of George Patrick O'Malley at Murrisk Friary, Co. Mayo, Ireland. (Photo: Author). (**b**) Plaque at Murrisk Friary, Co. Mayo, Ireland. (Photo: Author)

Bamiyan Valley in Afghanistan is an especially good illustration of the ambiguity of so-called religious iconoclasm. Images of the explosions set off by the Taliban in the valley flashed around the globe, and the destruction was decried in the Western media as an example of the medieval mind-set of fundamentalist Islam (Flood 2002: 641). The fact that the two statues, classic examples of sixth-century CE Gandhara-style sculpture, 120′ and 180′ high (Fig. 2), had survived since the ninth century CE, when Buddhism was supplanted by Islam in the region, suggests that something else must have motivated the timing of the destruction. A closer examination of the events leading up to the edict issued by the Islamic State of Afghanistan on February 26, 2001, which ordered the destruction of all such idols, suggests that "their obliteration indexed not a timeless response to figuration but a calculated engagement with a culturally specific discourse of images at a particular historical moment" (Flood 2002: 642). The intended audience of the message sent by the Taliban was more global than local, an act that referenced archaic rhetoric but was carried out according to contemporary motivations and targeted the Buddhas less as religious than as cultural icons of particular value to the West (Flood 2002: 651).

Politically expedient erasure of the past often takes the form of selective representation motivated by nationalism, exaggerating or even fabricating evidence that is perceived as positive and downplaying or denying evidence that is not seen as supportive of the political regime or special interest groups with political influence. In Nazi Germany, this involved a range of selective erasures, from destroying archaeological deposits of "non-Germanic" occupations of settlements to focus on those of interest to the state to using material culture evidence to justify territorial expansion by military occupation (Arnold 1999). In Washington, DC, in 1995, a controversial exhibit intended to commemorate the 50th anniversary of the end of World War II was replaced by a display of the *Enola Gay*, the plane that dropped the atomic bombs on Hiroshima and Nagasaki; this was due to the pressure put on the museum by politicians and veteran's groups more concerned with image than with accuracy (Nobile 1995; Goldberg 1999). What makes the manipulation of the past in Nazi Germany and the 1995 Enola Gay exhibit at the Smithsonian's Air and Space Museum comparable to one another is their politically expedient treatment of historical facts. The parallels can be found in the emphasis placed on a usable past, by which governments or special

Erasure of the Past, Fig. 2 Large Buddha at Bamiyan, Afghanistan. (Photo: Courtesy of ARTstor, ACSAA_MICHIGAN_1039425966)

interest groups generally mean a past that is useful to them; the phrase "a past that the (American/German) people can be proud of" appears in the press releases of Newt Gingrich in connection with the Enola Gay exhibit as well as in the speeches of Heinrich Himmler on archaeology in the service of the state (Arnold 1999: 1).

Key Issues/Current Debates

Identity politics, often presented as a positive force, can be a major factor in the creation of the kind of divisive climate in which the erasure of the past becomes justifiable: The moment a monument, site, or other categories of material culture is singled out as culturally important for one group, it becomes a potential target for destruction by another (Adams 1993). Cultural relativism and political correctness, both of which appear initially to be about inclusiveness, have the potential to create deep divisions when conflicting value systems are involved in a struggle for hegemony. Shrinking funding for heritage preservation is another major challenge; paradoxically, as the archaeological past has become less politically useful to nation-states in areas like the EU, state support for site protection and maintenance has also dwindled. Military conflict continues to cause both direct and indirect damage to cultural heritage around the globe, as the massive losses in the Middle East in the wake of the two Iraq wars have clearly demonstrated; in addition to the destruction of sites through military installations and conflict-related damage, looting of unprotected archaeological sites has permanently affected Iraq's ability to reconstruct its own past (Rothfeld 2008).

International Perspectives and Future Directions

The most important take-home message related to the topic of the erasure of the past is the recognition that it is not a culturally specific phenomenon and cannot be associated with any particular area of the world, religious tradition, or period of time. Education is one of the best ways to combat the increasingly powerful forces of cultural polarization, especially education focused on celebrating difference rather than demonizing it; fostering in the young a willingness to engage in honest confrontation of all aspects of the past, even those that may not cast our particular in-group in a wholly positive light, is another. We should also recognize that the erasure of the past can be a creative force as well as a destructive one and that it is an inevitable part of the many densely layered human experiences that have been inscribed on the landscape in the form of monuments, structures, and artifacts over many generations.

Definitions of authenticity also may need to be redefined in light of new criteria. It is telling that the International Council on Monuments and Sites (ICOMOS) determined the authenticity of the reconstructed Old Bridge at Mostar on the grounds that it is a "place of memory" even if

the original fabric of the monument has been destroyed. The 2005 World Heritage inscription citation for the Mostar bridge sends the message that destroying the physical remains of cultural heritage does not destroy the cultural memory with which the place itself is imbued, citing its symbolic power and meaning as an exceptional and universal symbol of coexistence of communities from diverse cultural, ethnic, and religious backgrounds as the basis for the listing (Cameron 2008: 23).

We would do well, however, to remember that heritage preservation and the presentation of the past are processes that erase the past just as surely as warfare, looting, or development do. Providing support, both financial and in terms of preservation expertise, to developing nations facing unprecedented destruction of cultural heritage must be part of the equation. Deciding which cultural monuments or artifacts to preserve or display and which not inevitably leads to the exclusion, and possibly destruction, of those not chosen. The goal must be to ensure that such selective erasure, while it may be unavoidable, is at least mindful and based on some degree of consensus among stakeholders. Even in the interests of inclusiveness, however, bowing to the majority opinion is not necessarily always the best approach to take when making culturally sensitive decisions about interpreting the past. As Goldberg notes in the wake of the Enola Gay debacle, "While objectivity cannot be a matter of political will and discipline, it can be attained through a social process – one which requires forums for the free flow and exchange of ideas for its successful implementation" (1999: 181). Scholarly expertise is a valuable commodity that has come under attack of late, especially in the United States (Nichols 2017); we should put more trust in the voices whose authority is derived from such sources rather than privileging those that are motivated by political expedience. On January 30, 1995, with the Smithsonian's announcement of the withdrawal of the controversial exhibit on the bombings of Hiroshima and Nagasaki, political expedience won the day. Perhaps by the time of the next major anniversary of the end of World War II, the United States will have matured enough as a nation to face its own past squarely and will not need to engage in such acts of selective erasure.

Cross-References

- ▶ Activism and Archaeology
- ▶ Archaeological Stewardship
- ▶ Authenticity and the Manufacture of Heritage
- ▶ Authority and Legitimacy in Political and Social Archaeology
- ▶ Bamiyan Buddhas
- ▶ Collaborative for Cultural Heritage Management and Policy (CHAMP)
- ▶ Colonial Expansion and Nation-State Building: Influences on Archaeology
- ▶ Conservation and Preservation in Archaeology in the Twenty-First Century
- ▶ Contemporary Past, Archaeology of the
- ▶ Cultural Heritage and the Public
- ▶ Cultural Heritage in Times of Economic Crisis
- ▶ Cultural Heritage Management and Armed Conflict
- ▶ Cultural Heritage Management and Images of the Past
- ▶ Cultural Heritage Site Damage Assessment
- ▶ Cultural Landscapes: Conservation and Preservation
- ▶ Heritage and Archaeology
- ▶ Heritage and Public Policy
- ▶ Heritage Ethics, Cultural Base of
- ▶ Heritage Legislation, the Introduction of: Disciplining Through Law
- ▶ Immovable Heritage: Appropriate Approaches to Archaeological Sites and Landscapes
- ▶ International Committee on Archaeological Heritage Management (ICAHM) (Conservation and Preservation)
- ▶ International Conventions and Charters and Archaeology Presentation
- ▶ International Conventions Pertaining to Heritage Policy: Introduction
- ▶ International Heritage Conservation Principles: Historical Overview
- ▶ Kosova: Archaeological Heritage
- ▶ Landmarks Foundation: Protecting Sacred Sites Globally

- ▶ Lawyers' Committee for Cultural Heritage Preservation (LCCHP)
- ▶ Local Populations and Global Heritage
- ▶ Military Activity in Islamic Archaeology
- ▶ Modern Ruins: Remembrance, Resistance, and Ruin Value
- ▶ Nationalism and Archaeology
- ▶ Organization of World Heritage Cities (OWHC)
- ▶ Preserving Heritage: The Role of the Media
- ▶ Public Involvement in the Preservation and Conservation of Archaeology
- ▶ SAFE/Saving Antiquities for Everyone
- ▶ Society for Historical Archaeology (SHA) (Cultural Heritage Management)
- ▶ Stakeholders and Community Participation
- ▶ Statues and Monumental Art in Archaeology
- ▶ Sustainability and Cultural Heritage
- ▶ Vandalism and Looting: Destruction, Preservation, and the Theft of the Past
- ▶ World Heritage Education, Training, and Capacity Building
- ▶ World Heritage List: Criteria, Inscription, and Representation
- ▶ World Heritage Objectives and Outcomes

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Basic Biographical Information

Kenan Tevfik Erim was born in 1929 in İstanbul. He started his education in Sweden, and in 1948 continued in the USA at New York University. After graduating from the Classical Archaeology Department of New York University, he received his M.A. and Ph.D. at Princeton University. He served as assistant to Professor Karl Erik Sjoquist during the excavations of Morgantina, Sicily.

Major Accomplishments

Kenan Tevfik Erim's name is associated with excavation of the ancient Aphrodisias settlement, located in Geyre, Aydın. The ancient city of Aphrodisias was a magnificent city which

displays evidence of ancient Greek and Roman occupation in Turkey. The city has seen continuous habitation which has contributed to its importance of establishing the developmental sequence of the period. Besides the nearby marble quarries, the settlement was noted for a local sculptural tradition which eventually spread all over the Mediterranean.

Erim, who visited the site in 1959 for the first time, decided to reveal this remarkable settlement after seeing the remains of the city. In 1961, Erim raised funds from several private foundations and New York University, and obtained permits to begin excavations in Aphrodisias.

He continued to serve as a professor in the Classical Archaeology Department in New York University, and as head of the excavations in Aphrodisias until his death. He provided the largest contribution by publishing articles and conducting seminars all around to world in order to create an international reputation for Aphrodisias and raised funds, especially from US foundations. He set up associations for Aphrodisias in New York, Paris, London, Izmir, and Istanbul.

Kenan Erim was awarded the Liberty Medal of New York City in 1986, the Commendatore Merit of Italy in 1987, and the National Geographic Society Centennial Medal in 1988. He passed away in 1990. His grave, which is in Aphrodisias City, is located on the south side of the monumental ceremonial gate. Excavations are still continuing in Aphrodisias.

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Erkanal, Hayat

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Basic Biographical Information

Hayat Erkanal was born in 1959 in İzmir, Turkey. He completed his education, which he started in the Protohistory and Near Eastern Archaeology Department and Faculty of Languages, History and Geography, of Ankara University, in 1959, with his undergraduate thesis entitled *Goddess Ea on Babylonian Cylinder Seals* in 1964.

After serving in several roles in the Ankara Museum of Anatolian Civilizations from 1963 to 1964, Erkanal went to Germany to undertake his Ph.D. studies in 1966. He was lectured by professors including Kurt Bittel, Einer von Schuler and Barthel Hrouda. After receiving his Ph.D. for

his dissertation entitled *Central Anatolian Metal Weapons in the Second Millennium*, he returned to Turkey in 1973.

Afterward, Erkanal worked as a specialist in the archaeology museums of İstanbul and in the same year, he was appointed in Erzurum Ataturk University as assistant until 1976. Later he continued as an assistant in the Faculty of Languages, History and Geography of Ankara University and with the approval of his thesis entitled *Cutting Tools in Anatolia During Bronze Ages*, Erkanal became assistant professor in 1979 and professor in 1988.

Major Accomplishments

Beginning as an undergraduate, Erkanal constantly attended excavations such as Kültepe, Altıntepe, Maşathöyük, and Samsat until 1979. From 1980, he started to conduct projects mostly about survey studies and excavation content. The excavations that he carried out in Girnavaz–Mardin resulted in a better understanding of the effects and distribution of Mesopotamian culture over Anatolia.

Erkanal served as assistant dean of the faculty from 1986 to 1990 and lectured at Munich Ludwig Maximilian's University on southeast Anatolian archaeology for a semester. Starting in 1992, he conducted the Liman Tepe excavation which is a part of the Klazomenai ancient site in Urla, İzmir. In 1992, while examining the aerial photos of the site taken for a municipal plan, he noticed some traces related to the coastal plain and identified that the part of the settlement was underwater. This was the beginning of the first underwater excavation of Turkey. Initially, because of the lack of equipment and experience, the excavation was started with the cooperation of Israel's Haifa University. Then Erkanal and his team took over and carried out the studies. Erkanal, to ensure the smooth progress of the excavation, learned to scuba dive after the age of 60 and led the studies.

With his work, he effectively exposed the cultural and chronological development of Western Anatolia related with Aegean world and Levant. This work paved way for the understanding of the early cultural history of Western Anatoliaon a large scale. By establishing the Research and Application Centre of Underwater Archaeology, hosted by Ankara University, he opened a new field for students and researchers.

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- ▶ Underwater Archaeology
- ▶ Underwater Sites in Archaeological Conservation and Preservation

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Esin, Ufuk

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Basic Biographical Information

Ufuk Esin was born in 1933 in İzmir, Turkey. She went to Arnavutkoy fifth Elementary School, Bosphorus High School, and the Austrian High School. In her youth, she was interested in pursuing a career as an amateur actor. She also undertook administrative duties in plays. In 1954, she commenced her studies with the Archaeology Department, Istanbul University, which had Halet Çambel and Kurt Bittel as lecturers at that time.

She participated in the excavations of Boğazköy ve Fikirtepe during 1952–1954. She went to USA in 1961 under Fullbright scholarship and completed her dissertation by novel methods alien to the world of archaeology in 1966.

Major Accomplishments

The construction of dams as a part of the economic development of Turkey in the 1960s and 1970s prompted the need for salvage excavations in order to document settlements that were likely to be submerged. Ufuk Esin conducted important work this context. She began to excavate Tepecik in 1968, Tülintepe in 1971–1974, and Değirmentepe in 1978–1986. She became the head of Archaeology Department at Istanbul University in 1984.

Ufuk Esin pioneered establishment of the Archaeometry Unit which combines natural sciences and archaeology in TÜBİTAK (The Scientific and Technological Research Council of Turkey). Furthermore, even though Turkey was not accustomed to interdisciplinary team work culture consisting of scientists and specialists from different work fields at that point of time, she led the integration of this approach, by using all of the facilities available in the Archaeology Department during her tenure as Head as well as through the Aşıklı Höyük salvage excavations that she started in 1989. She was one of the founder members of TÜBA (Turkey Academy of Sciences), which was constituted in 1993. She retired in 2000 but continued with her scientific activities in TÜBA. Under the title of the "Culture Sector of Turkey," she executed a quite comprehensive inventory study that includes both written and oral history. This provided a major contribution to establishment of the concept of cultural heritage in a holistic manner.

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▶ Çambel, Halet

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Estate Landscapes in Historical Archaeology

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Brief Definition of the Topic

The structure and impact of land ownership on the character of the European post-medieval landscape and its colonial territories have been relatively neglected compared to the emphasis placed upon comparable structures in earlier periods, such as the medieval manor. The landed estate – an extensive and largely contiguous block of land under the private ownership of an individual – is a product of the modern era following the decline of absolute monarchies and the Church from the sixteenth century. However, the extent and chronology of change over the transition from the medieval landscape varied widely across Europe. More significantly perhaps, the extent to which the landscape was owned by a relatively small group of wealthy owners remained largely obscure until the late-eighteenth and nineteenth centuries, when waves of radical opposition questioned the power of the traditional elites.

Landed estates are made up of recognizable and recurrent features. At their core is the family dwelling or seat which was distinguished from other houses in terms of scale and ornamentation. It was often surrounded by or adjacent to a designed landscape, often incorporating a water feature, such as a moat, canal or artificial lake. The house and its immediate landscape have been well studied by art historians and the biographies of key artists, architects, and landscape designers, and the chronologies of style are well documented, though overly dependent on a handful of larger examples. A kitchen garden and "home farm" supplying the victuals needed by the owner's household were also core features. The surrounding landscape of farmland, woodland, villages, and farmsteads was an important foundation from which the owners drew income and exercised a considerable degree of social and political control. The architecture of the farm buildings, farm houses, and domestic houses in villages was an important medium through which the extent of the estate and the social identity of the owners were expressed.

The size and distribution of estates have been a matter of considerable debate among historians as well as contemporary observers. From the late-nineteenth century, when reliable statistics become available in the UK, the most common division was between the "great landowners" who owned over 10,000 acres and were nationally significant and the local gentry who might own between 3,000 and 10,000 acres and whose influence was more regionally defined. The situation elsewhere is less clear, particularly in Continental Europe, while in colonial contexts, where income from cash crops such as sugar was far higher per acre, and labor was enslaved, the units of landownership were initially on a much smaller scale. Plantations were, on average, larger than English tenanted farms but much smaller than gentry estates.

The distribution of estates tends to be biased toward areas of poor light soils where smaller owners found it difficult to sustain a living, and so estates grew larger and held a greater proportion of the agricultural land. This is true of eastern England, southern Sweden, and eastern Denmark,

for example. Government or royal proclamations could either restrict or promote land sales and land accumulation, affecting the land market and the ability to establish large blocks of land. Inheritance patterns could also have a dramatic effect on land ownership and the ability to pass estates on across the generations. In Britain the whole estate passed to the eldest son under primogeniture, whereas in the northern Germanic regions land was shared between all sons, and in Scandinavia it was divided between all offspring.

The study of estates as cultural landscapes is in its infancy but it has the potential to provide a greater understanding of the form, typology, and extent of estates as well as their impact on the landscape character from the sixteenth century to the present day. Estates were often marked out in the landscape by the higher proportion of woodland and forest, or by features such as roadside tree planting to afford shade and a degree of status to the approach. Milestones or boundary markers might also mark the extent of the estates. As centers of private wealth and symbols of political and social power, landed estates created a distinct form of cultural landscape that was ubiquitous and integral to the globalization of the modern era.

Cross-References

- ▶ Agrarian Landscapes of the Historic Period
- ▶ Capitalism: Historical Archaeology
- ▶ Caribbean Historical Archaeology
- ▶ Landscape Archaeology
- ▶ Post-Medieval Archaeology

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Estrada, Emilio

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Basic Biographical Information

Emilio Estrada Icaza was born in Guayaquil, Ecuador on June 22, 1916. As the son of a prominent business family, Estrada spent his childhood in his native city, but as a teenager, he frequently moved to Europe due to his father's diplomatic appointments. After living in Italy and France, he returned to Ecuador and eventually attended the Baylor Military Academy in Chattanooga. He continued his studies at the Wharton School of Economics at the University of Pennsylvania after which he returned to administer the family business in Guayaquil. When his father, Emilio, and his brother Julio became members of the board of Banco la Previsora, Emilio founded Ecuacolor and other entrepreneurial projects.

Estrada was a renowned athlete, specializing in the hammer toss and javelin while at college. In later years, he became an important figure on the national Ecuadorian sailing team, earning a bronze medal at the 1960 Pan-American games in Chicago. He introduced lighting boats to Ecuador, became president of the lighting boat society, and represented the yacht club and the National Soccer Federation. Although not regarded as a politician, he was a grandson of Emilio Estrada Carmona, President of Ecuador, and could not escape public service. He served as Mayor of Guayaquil from 1954 to 1956. Refusing the presidential candidacy, he served as Ecuador's delegate to the United Nations General Assembly.

While frequently hunting ducks, he started collecting pottery fragments, then entire pots, and eventually carried out his own excavations. In roughly 10 years, he undertook more than 1500 excavations with the help of his field director, Julio Viteri Gamboa. Seeking interpretations of his sherd collections he met *Diario la Nación*

Estrada, Emilio,
Fig. 1 Emilio Estrada at Víctor Emilio Estrada Museum (National Library)

journalist Francisco Huerta, who first supplied him with books on archaeology and later became his mentor, along with Carlos Zevallos Menéndez (Fig. 1).

Major Accomplishments

In 1953, at the age of 37, Estrada visited Betty Meggers and Clifford Evans at the United States National History Museum and invited them to Ecuador. Through the recommendation of Huerta, they excavated Hacienda la Chorrera and Tejar, resulting in Evans and Meggers' report, *Preliminary Report on Archeological Investigations in the Guayas Basin, Ecuador* (Evans and Meggers 1955). At the same time, Estrada published his first monograph, *Ensayo Preliminar Sobre la Arqueología de Milagro* (Estrada 1954), after which he published *Balsa and Dugout Navigation in Ecuador* (Estrada 1955), which, although not strictly archaeological, combined his knowledge as a sailor and a historian.

After serving as Guayaquil's Mayor, Estrada published the monograph *Valdivia, un sitio Arqueológico Formativo en la Provincia del Guayas, Ecuador* (Estrada 1956). Although Valdivia pottery had already been discovered, it was Estrada who first recognized its significance. He used C14 dating to conclude that Valdivia was, at that time, the earliest known ceramic assemblage of the Americas. In 1957, during a meeting held at the Casa de la Cultura Ecuatoriana, with the assistance of Meggers, Evans, Mathew and Marion Sterling, Pedro Armillas, Francisco Huerta, and Olaf Holm, Estrada presented the "Cronología de la Cuenca del Guayas"(Estrada 1957a). That same year, he published *Los Huancavilcas*: *Ultimas Civilizaciones Prehistóricas en la Cuenca del Rio Guayas* (Estrada 1957b) and *Prehistoria de Manabí* (Estrada 1957c) and a short essay titled "Sumario de Características Milagro-Quevedo" (Estrada 1957d). In 1958 following his interest on the costal Ecuadorian formative, he published *Las culturas pre-clásicas, formativas o arcaicas del Ecuador* (Estrada 1958) (Fig. 2).

In 1959 and 1960, Estrada published *Arte aborigen del Ecuador, sellos y pintaderas* (Estrada 1959), a photo album *El Arte prehistórico de Manabí norte y Esmeraldas*, newspaper articles on "Guayaquil y su prehistoria" and *Cultura Valdivia,* with Evans and Meggers (Evans et al. 1959). In the 1960 edition of *Vistazo*, assembling data from Manabí and Guayas, Estrada published one of his most controversial articles, "Asiáticos desembarcaron hace 2.000 años en el Ecuador" (Asians arrived by boat in Ecuador 2000 years ago). In 1961, he co-authored a paper with Meggers that studied traits of probable transpacific origin (Estrada and Meggers 1961).

At the age of 45, Emilio Estrada suffered from a heart attack. His sudden death was a great loss to the archaeology of Ecuador. His postmortem publications include "Arqueología de Manabí Central" (Estrada 1962) and *The Jambelí Culture* (Estrada

Estrada, Emilio, Fig. 2 Roundtable on the Archaeology of Coastal Ecuador, organized by Carlos Zevallos Menéndez at the Casa de la Cultura Ecuatoriana, Estrada is first on the left. (Photo; Carlos Zevallos Menéndez Museum)

et al. 1964). However, his most controversial piece of work was without doubt *Early Formative Period of Coastal Ecuador: the Valdivia and Machalilla Phases* where he appears as the third author. In that publication, Meggers, Evans, and Estrada claimed that Valdivia was derived from the Japanese Jomón Culture (Meggers et al. 1965). This idea was met with excitement and disagreement, and some scholars doubted that Estrada agreed with this claim, since the book appeared 4 years after his death. When he died, Emilio Estrada was only 45 years of age and planning a new expedition to Esmeraldas in northwest coastal Ecuador. In only 11 years of active research, he produced an outstanding record of quality publications, as evidenced by the fact that most of his interpretations are still current.

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Ethics and Human Remains

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> . . . due dignity and respect should be afforded in the recovery, storage, investigation and reburial of human remains regardless of their context. (Hunter et al. 2001: 176)

Ethics is a branch of philosophy concerned with the evaluation of the principles and standards of human conduct that govern the behavior of individuals and groups (Bottorff 2005). Most professions adhere to an agreed code of conduct, commonly referred to as a "code of ethics," with the intention being that all practitioners should undertake "best practice." In reality, however, definitions of "best practice" vary because different cultures, societies, and groups have diverse value systems, namely, their own definitions of what is considered right (*appropriate*) and wrong (Walker 2000: 20; White 2000: 319). Because of the emotive nature of death, the treatment of human remains is often contentious and poses many ethical dilemmas.

Locating and Recovering Human Remains: Digging Up the Dead

While human remains may be located accidentally (e.g., washed up on a beach, eroded out of a riverbed, etc.), there are a number of situations where human remains are intentionally recovered. Human remains may, for example, be excavated as part of a planned university archaeology research project investigating subjects such as past burial practices or changes in diet. It has been argued that the antiquity and lack of personal identification of the individuals justifies this endeavor.

Increasingly, the need for land in urban areas with expanding populations (e.g., in the UK or Portugal) results in the exhumation of known burials and cemeteries (Sayer 2010). In some instances building continues over the cemetery (e.g., a car park was constructed over some 9000 burials at the Queen Victoria Markets, Australia – Cooper 2011). In other cases funding is provided for a salvage recovery of the remains prior to development (e.g., the recovery, analysis, and relocation of the remains of some 260 children buried in a cemetery at the former Randwick Children's Asylum, Sydney, Australia, prior to development of a new hospital facility – Anon 1997). The ethical questions that arise from deciding whether or not to salvage human remains include: Why, in some instances, should human remains be left in situ and built over, while, in other cases, the remains are exhumed, curated, and stored as part of a salvage operation? Should the antiquity of the remains or whether the individuals are identified play a part in the decision to salvage human remains?

There are situations where communities have argued they have ancestral links to the human remains (see below for further discussion) and either demand to be included in the excavation to appease the spirits of the dead or object to the excavation and analysis of remains altogether (see examples cited in Sayer 2010: 70–74).

The location and recovery of human remains may also be undertaken as part of forensic investigations either to provide evidence for courts in prosecuting, for example, genocide and/or crimes against humanity, or to identify individuals to return the remains to their families (e.g., Blau 2015). One of the ethical quandaries is why evidence in the form of human remains is collected for identification (usually undertaken as part of a humanitarian investigation) and becomes secondary to evidence collected for formal prosecution (e.g., Fondebrider 2002: 889; Skinner and Sterenberg 2005: 231 cf. Burns 1998: 82). While resemblance is enough for some (e.g., Kadhim 2006), positive identification is given to others (e.g., Budimlija et al. 2003).

Each scenario raises questions about the ethics of digging up the dead. Such questions pose ethical dilemmas for those involved in the recovery and analysis of human remains.

Analyzing Human Remains

While death is biological, it is also an inherently social process (McEvoy and Conway 2004: 541; Prior 1989: 13), particularly given the "premise that human rights continue at death" (Vizenor 1996: 653). It is the dichotomy between human remains as utilitarian objects of scientific interest and human remains important for their cultural, symbolic, and spiritual value that raises many ethical questions for those studying or working with human remains, whether from archaeological or forensic contexts.

Sociocultural attitudes toward the dead should be considered by practitioners dealing with the deceased (e.g., Hunter and Cox 2005). While the living body is usually regarded as a person, it has sometimes been argued that after death the body becomes merely an object (e.g., McEvoy and Conway 2004: 540). In the forensic context, the body (object) is regarded at one level as empirically unchallengeable evidence (The idea of the corpse as an object is, however, in contrast to the interpretation of a corpse under Anglo-Australian law, where the corpse "cannot be the subject of property so cannot be stolen" (Frekelton 1988: 259) and is, therefore, not considered an object (Hubert 1992: 119).). This is particularly relevant to those dealing with human skeletal remains.

An anecdotal survey of forensic and biological anthropology students' attitudes to human skeletal remains showed that only half of the cohort ($n = 16$) who had excavated human skeletal remains identified with them as once being a living person (Blau 2016: 594; see also McEvoy and Conway 2004: 540). Such views, however, contradict the fundamental ethical principle for modern research in the biomedical and social sciences: respect for human dignity based on "the belief that it is unacceptable to treat remains solely as . . . objects or things" (Walker 2000: 20).

Depending on the context of the location and recovery of human remains, a number of different types of analyses are possible. Attitudes toward studying (and displaying and storing – see below) human remains are greatly influenced by attitudes of the living toward the dead. In some cases, the political and religious beliefs of communities result in rulings to prevent archaeologists and anthropologists from studying human remains (e.g., the case of Jewbury in York, UK – Sayer 2010: 79–82).

Osteologists and forensic anthropologists perform a range of analyses that may include determining whether the material is actually osseous, the bone is human or nonhuman, and/or the human remains are of forensic significance. Analyses may also include describing the condition and preservation of skeletal remains; developing an inventory of recovered remains; determining the ancestry, sex, age, and stature of the individual; and describing any individualizing characteristics and any pathological and/or traumatic injuries. Each of these specific practices, including the formation of the final report, has associated ethical considerations.

In the analysis of skeletal trauma, for example, how invasive should a forensic anthropologist be? In the case of a 35-year-old female homicide victim who exhibited extreme peri-mortem soft tissue trauma to the head and neck, how much more information will be gained from decapitating the head and macerating and cleaning the remains (e.g., Marks et al. 1999: 263)? Is it necessary to have a code of practice which stipulates the extent to which the practitioner can be invasive, or "is it just better to let the . . . anthropologist work to their conscience on the principle of "best practice" (Hunter and Cox 2005: 220)?

Much has been written about the politics associated with indigenous human remains (e.g., Cantwell 2000; Hubert 1992; Jones and Harris 1998; McEvoy and Conway 2004: 542–547; Pardoe 1992; Vizenor 1996; White 2000: 323–326). It is important that people dealing with human remains, particularly in countries with a colonial history, be aware of the potential social and political concerns and debates surrounding indigenous remains. It is important to appreciate

that the results of, for example, an ancestry determination may have serious political, social, and ultimately economic implications (Cantwell 2000).

Undertaking Research Using Collections of Human Remains

Some argue that undertaking research using collections of human remains is vital. For those undertaking research on archaeological remains, it provides the opportunity to gain a detailed understanding of past human lifestyles and activities. Consideration, however, must be given to the ethics surrounding research using human remains.

Consider, for example, the analyses of the human skeletal remains recovered from Spitalfields, the site of a former medieval priory and hospital in London. The individuals recovered were of known age and sex and often had living relatives (Molleson and Cox 1993). In such cases, who authorizes whether or not the remains should be studied?

Is it appropriate for practitioners to base their research on collections of human skeletal remains curated in museums, particularly when such collections are viewed as a violation of fundamental human rights by some indigenous groups (Walker 2000: 19)? Many indigenous groups promote reburial of what they perceive as ancestral remains. When the remains are archaeological and are of some antiquity, researchers argue that the ancestral links of living groups who promote reburial of the remains are tenuous (e.g., Afrasiabi 1997): how does one group of people prove a long ancestral relationship with ancient skeletal remains (Webb 1987; Donlon 1994; Thompson 2003)? Even if/when a link can be established, the question remains about whose past it is anyway – who "owns" the past?

The majority of techniques used by osteologists and forensic anthropologists today were developed using descriptions and measurements collected either from archaeological collections where age and sex were unknown (e.g., Molleson and Cox 1993) or from anatomical samples (e.g., The Huntington, Terry and Hamann-Todd Collections) where independent records of these biological attributes exist (Hunt and Albanese 2005). It has been argued the research on contemporary human remains is important because of the need to improve population-specific techniques with which to analyze forensic cases (see Ubelaker, this volume on Osteology Reference Collections).

Given the sensitive nature of the material archaeologists and forensic anthropologists examine, and to avoid notions that practitioners can undertake any research they feel is appropriate (See Beloff 2003 for a discussion on notions of appropriateness cf. Bahn's conclusions "archaeologist have the right to do just about anything in the name of scholarship" (Bahn 1984: 127). Bahn's conclusions differ little from some medical practitioners in the nineteenth century who believed "they were entitled to make whatever uses of the dead they wished" (MacDonald 2005: 189).), all research or publication using skeletal material must be undertaken with the appropriate ethics research committee approval. It is not, however, enough to "do the paperwork": the broad ethical implications must be considered during and beyond the lifespan of the project (Loff and Black 2004).

Is it appropriate to undertake research based on human remains exhumed for evidence in war crime trials? If it is considered appropriate, has consent from the relatives of victims been sought and given (Hunter and Cox 2005: 215)? While assessment of the utility of forensic anthropology methodologies as applied to specific populations certainly has a place in terms of addressing the relevance of standards (e.g., Schaefer and Black 2005), exactly how data are collected to develop population-specific standards must be scrutinized (e.g., examples cited in Hunter and Cox 2005: 215). Consider research aimed at using cranial morphology to differentiate between a Croatian and a Bosnian (Griffis 2001). Does such research take into account the complicated politics resulting in the 1992–1995 Bosnian war? Such questions raise the importance of the need for cultural and ethical awareness and invite the larger question: what limits should one put on the expert's right to information (Meskell and Pels 2005: 5)?

Is it ethical to undertake research but never publish the findings? For example, one of the issues raised by some Australian Aboriginal groups in discussions about the return of a prominent skeletal collection was the fact that despite the museum in

question having held the remains for over 70 years, the researchers had published relatively little on their findings (Associate Professor Chris Briggs, The University of Melbourne, personal communication 2005; see also Hubert 1992: 116). What benefits, therefore, could be gained from the continued curation of these remains?

Displaying and Storing Human Remains

Differences in attitudes to death, the deceased, and human skeletal remains have a significant impact on ethical issues related to the display and storage of human remains. In many contemporary Western societies, there is a lack of familiarity with the dead (e.g., Adams 2000; Baudrillard 1993: 181–182; Richardson 1987; Walker 2000: 5): death is seen as a clinical process, and physical contact with the deceased is rejected as events surrounding death and dying are often suppressed (e.g., Blaauw and Lahteenmaki 2002: 772). In contrast, in other cultures, families choose to have physical contact with their dead relatives as part of the grieving process. While some societies actively and openly display human remains, as in the case of the Cemetery Church of All Saints in the Czech Republic, other cultures are highly offended by the display of their ancestors, as with some indigenous Australian and Maori communities from New Zealand (for further discussion on the different values placed on human skeletal remains, see Hubert 1992: 117–118; and Walker 2000: 12–18).

Repatriation and Reburial

There are strong differences of opinion between indigenous groups and professionals involved in dealing with human skeletal remains about repatriation and reburial (Ubelaker and Grant 1989). The process of repatriation and reburial is seen by many indigenous groups as a vital part of their cultural traditions and/or religious beliefs requiring the spirits of their ancestors to be laid to rest through respectful burial. Other groups, typically associated with universities, museums, and professional organizations, argue that reburial results in the loss of important scientific knowledge and is the death of bioarchaeology (e.g., Donlon 1994; Weiss 2008: 48). While many osteologists have been critical of repatriation and reburial, some practitioners from the USA argued that the passing of the 1990 Native American Graves Protection and Repatriation Act (NAGPRA) actually increased the number of skeletons studied and funds required for the analyses (Rose et al. 1996).

In 1995 skeletal remains of a teenage girl dated to the Roman period were discovered in the city of London during commercial development. The remains were housed at the Museum of London for 12 years, and following a Christian church service in 2007, the remains were re-interred near the original place of discovery (Anon. 2007). Questions that then arose included: why, of all the individuals recovered in the city of London, were the remains of this one individual chosen to be reburied? Was it appropriate to have a Church of England ceremony for this individual? Such questions clearly illustrate the complex politics of the dead.

There are numerous important questions to be addressed in the process of deciding whether or not to repatriate and rebury human remains. These questions include: how are human skeletal remains attributed an affiliation to a living human group? Does the antiquity of the human skeletal remains affect the rigor of claims of affiliation? At what point do oral traditions support affiliation? Are oral traditions or physical evidence more important in "proving" affiliation, and "more important" to whom? What happens in situations where human skeletal remains cannot be attributed an affiliation?

The recovery, analysis, and storage of human skeletal remains raise a number of complex questions. Practitioners dealing with human remains have an ethical responsibility to be aware of the myriad of different responses to such questions.

Cross-References

- ▶ Ethics of Collecting Cultural Heritage
- ▶ Forensic Anthropology: Definition
- ▶ Human Remains Recovery: Archaeological and Forensic Perspectives
- ▶ Repatriation: Overview

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Ethics in Archaeology

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Introduction

Regardless of location, specialty, rank, heritage, gender, or age, ethics is an important part of the practice of every archaeologist. Archaeologists learn about, apply, and debate ethics in formal and informal contexts: college classrooms, staff meetings, publications, field-research sites, and at the bar (or metaphorical watercooler) during professional meetings. Long ago, the discipline of archaeology abandoned the idea that archaeologists practice in isolation a value-free science, free from interactions with modern peoples. Ethnic conflict, colonialism (and post-colonialism), globalization, structural inequalities, illicit markets, development, nationalism, imperialism, and terrorism – these realities of the world are all directly or indirectly connected to the global practice of archaeology.

Archaeology is the systematic study of past cultures and peoples based on analysis of recovered material evidence. Archaeologists reveal, interpret, and preserve parts of our global past – but, as noted by Pyburn and Wilk (2000: 83): "If archaeology is to survive. . .its practitioners must forfeit the luxury of burying themselves in the past." In performing their duties, archaeologists frequently confront ethical decisions and responsibilities concerning interactions with various publics, the collection, use, curation, or disposal of material evidence and responsibilities within the profession regarding safety, publication, or other professional standards. Archaeologists may be asked to determine the significance of someone else's history, test the validity of an Indigenous group's land claim, teach about evolution and human origins, or provide locations of cultural heritage sites to military during times of armed conflict. More frequently, narratives archaeologists write are used to guide development initiatives, influence public policy concerning preservation of "significant" historical properties, and instruct the public on the diversity of human practices in an increasingly globalized world. Thus, archaeologists play many roles and hold many responsibilities. Archaeology, therefore, is a relevant and applied science in the modern world, one that makes real impacts on living people and, thus, one that requires professional ethics.

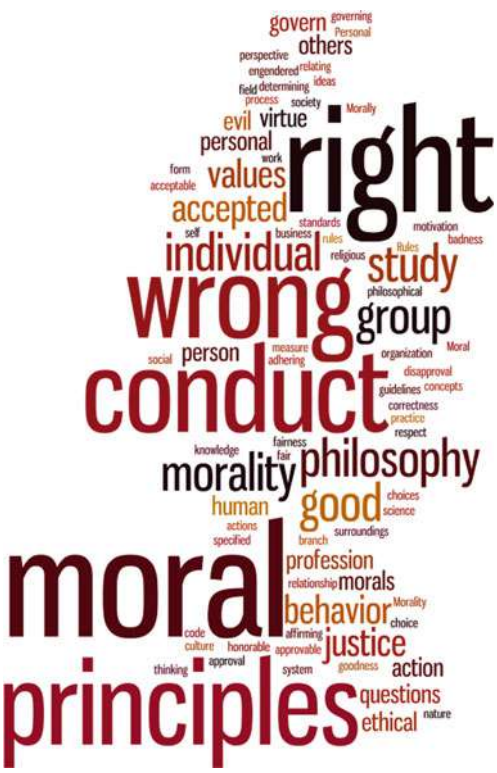
Above all, ethics in archaeology is about the relationships that define the scientific discipline – relationships with colleagues, students, governments, Indigenous people, local communities, the general public, and people and objects of the past – the principles that guide actions, and the methods of ethical decision-making when relationships, principles, and practices are not in

harmony. Below, definitions and histories of ethics in archaeology are provided, along with a summary of major ethical issues and debates in global archaeology today. This entry will conclude by looking forward and speculating on the future of ethics in archaeology.

Definition

What Is Ethics?

Ethics is the study of standards or ideals that guide everyday behaviors, as well as the behaviors themselves. Ethics also refers to the standards, principles, and concepts of right and wrong behavior that are derived from moral reasoning and debate and are often discussed as rights, obligations, responsibilities, virtues, and/or benefits to others (Fig. 1). Many people confuse personal feelings and values, religious teachings, laws, and cultures (i.e., learned behaviors that are found to be "acceptable" in society) with ethics – none of these, in fact, are studies of standards that guide behavior. For example, laws may be based in ethical reasoning, but may be found to be unethical, such as former apartheid laws in South Africa. Laws also may not exist for some ethical principles such as honesty in reporting archaeological finds. Ethics is also not the same as religion because religious people are not the only ones with ethics. And, religious teachings, like cultural behaviors, are context dependent, meaning what is acceptable behavior in one religion/society at one time may not be acceptable in another (e.g., the practice of cannibalism or the imprisonment of Jewish people in Nazi Germany). However, personal feelings, religions, laws, and culture each have some bearing on the development of ethical behavior and ethical principles, demonstrating the complicated multifaceted process of studying ethics.



Ethics in Archaeology, Fig. 1 Word cloud generated from definitions of "ethics"

What Are Archaeological Ethics?

Archaeological ethics is composed of standards and principles that guide archaeologists and is used to judge the professional behavior of archaeologists (Fig. 2). Wylie (2003: 4) defines archaeological ethics as "a set of ideals that can give us leverage in judging existing practices as well as in making decisions about how to go on when conflicts arise or conventions are problematic" (see Table 1 for other recent statements on archaeological ethics). Simply stated, archaeological ethics is the study and discussion of how archaeologists *ought* to behave to meet professional and societal goals and exceed "typical behavior." Professional archaeological ethics is different than personal values and society's moral code, which prescribes "good" behavior of citizens, as some responsibilities of archaeologists are unique to members of the profession. For example, preservation and publication of research records are considered ethical tenets of archaeology, but few societies would argue it is unethical to destroy or refuse to publicly publish personal tax or citizenship documents.

Archaeologists interested in studying ethics, or who are facing ethical dilemmas, may approach the subject by a variety of means, including laws,

Ethics in Archaeology, Fig. 2 Word cloud of 100 frequently occurring words in archaeological ethics codes

Ethics in Archaeology, Table 1 Recent statements on archaeological ethics

"Today, ethical questions and dilemmas are more about relations among people than about things"	McGuire (2003: vi)
"Ethics are guidelines to assist professionals in meeting the specialized goals of their profession within the more complex circumstances of the greater society in which they live and work"	Lynott (2003: 25)
"Ethics in archaeology. . .are historically contingent and based on moral arguments, world views, and goals founded in certain ways of relating to the past that may or may not have a sound foundation or be shared by everyone"	Colwell-Chanthaphonh et al. (2008: 4)
"Archaeologists should be seeking to realise the highest gods of their profession, whatever these may be. Deciding what they are is one important part of archaeological ethics; determining how they may *legitimately* be achieved is another"	Scarre and Scarre (2006: 3)
"Ethics principles and codes of conduct should be treated as works in progress; they are never final, never written in stone. . .It is only through such a process of active, reflective debate that archaeologists can be accountable for their practice"	Wylie (2003: 13)
"In order for this discussion of [archaeological] ethics to be meaningful to everyone, we must look beyond archaeology as only a series of methods driven by a set of theories. . .the ethical practice of science must involve a thorough examination of the relationship between [scientists] and those with claims on the information so carefully sought by the scientist. In the case of archaeology, it is imperative for archaeologists to be aware that American Indians are one of the primary stakeholders in a complex and multifaceted past owned by no one but controlled by many"	Watkins (2003: 129)

schools of moral philosophy, professional societies' statements, and social conventions. For example, an archaeologist questioning "good behavior" related to publishing archaeological data may discover that (a) no laws exist requiring the publication of scientific data; (b) statements of professional societies argue sharing data with colleagues and the public is ethical, based on moral reasoning related to public responsibility and beneficence; (c) the same statements dictate that site locations should not be published and data derived from non-archaeological excavations (i.e., "looted" data) should not be used, based on professional valuing of preservation of archaeological sites and the assumed connection between these actions and increased commercialization of the past; and (d) a social convention exists among archaeologists not to share certain research data until it has been published by the discover/analyst.

Many local and national laws and international conventions apply to the ethical practice of global archaeology, including those centered on historic preservation, the prohibition of illicit trafficking of antiquities, and Indigenous peoples' rights (for further reading on cultural heritage laws, see Gerstenblith 2008; King 2008). For an excellent

summary of the "schools" of moral philosophy and of applied professional ethics, see Rachels 1998 or, for archaeological examples, see Colwell-Chanthaphonh et al. 2008. Finally, Wylie (1997) has identified different types and purposes of professional statements on archaeological ethics, including professional standards of conduct, general statements of goals, and special statements outlining responsibilities to Indigenous or other local peoples. Colwell-Chanthaphonh et al. (2008: 133–186) provide a compilation of 12 professional statements on archaeological ethics, many of which are also available online. While many common themes persist in such statements (e.g., the preservation of the "archaeological record"), there are no universally held ethics in archaeology. Each professional organization's statements reflect its positionality in the world, its history and place in time, and the core ethical values of its members.

Historical Background

> Ethics used to be simple in archaeology. . .Ethical questions were all about things: Did the person use up-to-date scientific methods to dig things up and adequately document the process? . . . Did the things end up in a museum and not for sale at Sotheby's? . . .Did the archaeologist publish what he learned? . . . However, at the dawn of the twenty-first century ethics in archaeology are not simple. They are very complex, conflicted, and confusing. Today, ethical questions and dilemmas are more about relations among people than about things (McGuire 2003: vii).

Ethics in archaeology has been, and forever will be, context dependent and the subject of great debates, both within the profession and society. New methodologies, scientific instruments, societal perspectives on "science," and stakeholders have led to reexaminations of what archaeologists *ought* to do. Though some early principles of archaeological ethics have persisted over time (e.g., the importance of discovering and documenting new cultural traditions), archaeological ethics is not now and never has been universally held. Though the first codified statements on ethics in archaeology were not written until the mid-twentieth century, by examining theoretical and methodological practices of past archaeologists, ethical values and principles may be inferred. For a summary of the history of ethics in global archaeology, see Colwell-Chanthaphonh et al. 2008 (especially Table 1.1, p. 19).

Early Ethics in Archaeology

Archaeology began as antiquarianism in most areas of the world, when scholar-adventurers sought to discover and collect relics from ancient "lost" civilizations. Over time, antiquarianism developed into material culture analysis, leading to the fields of Classical Studies, Egyptology, Assyriology, and archaeology (for more details, see Trigger 1989). Often working as part of the colonial structure in occupied places like Egypt, Cambodia, India, and the Americas, many early archaeologists felt little ethical responsibility to local people; their ethical obligations were instead focused on an assumed universal ethos relating to the discovery, collection, and display of archaeological objects.

As the scientific methodology of archaeology developed, new ethics arose, including the documentation of contextual information from in situ excavation and the preservation of archaeological sites. These changes led to the development of professional standards, including ethics of scholarship and professional accountability. In the United States, as early as 1906, legislation was passed that recognized damage done to sites of national cultural heritage by unscientific excavation and established the authority of archaeologists as professionals charged with protecting and studying evidence of the past (Harmon et al. 2006). The growth of archaeology programs in universities, codification of further laws defining archaeologists' roles to the past, and the creation of professional archaeological societies all acted to further separate scientific archaeologists from the public and define professional archaeological ethics. Early ethical statements of societies (e.g., Champe et al. 1961; see Colwell-Chanthaphonh 2008: 180–181) included principles such as sharing and publishing data, refraining from the buying and selling of artifacts, receiving proper training, and protecting archaeological sites and

data. As mentioned in the opening quote by McGuire, early archaeological ethics was primarily object centered.

"Modern Era" Ethics in Archaeology

In the last 50 years, a number of pressing issues have elevated ethics into a prominent part of global archaeological practices. Beginning in the 1960s, and stemming from recognition of the destructive nature of development projects and archaeological excavation, archaeologists argued for a professional conservation ethic. Mitigation and minimally intrusive excavation became standard practices to address research questions, especially in the newly created private sector of archaeology, often called cultural resource management (CRM). The quick growth of CRM inspired calls to define professional standards in archaeology that outlined traditional ethics of conservation and scientific practice but also new responsibilities to clients, employees, employers, competing and cooperating businesses, and the public (now a funder of archaeology through taxes) (Register of Professional Archaeologists 2012).

As CRM was booming, the global antiquities market (fueled by illicitly acquired "looted" objects) was burgeoning. Archaeologists called for international protections of archaeological sites and objects (i.e., "cultural property" or "cultural heritage"), arguing that ethos of "stewardship" and "appreciation of the past" were universal, as the past belonged to humankind. In an attempt to stem the looting of archaeological sites, archaeologists reiterated an anti-commercialization ethic, stating archaeologists should not participate in monetary valuation of the archaeological record. Additionally, archaeologists called for an ethic of public outreach and education, both to fulfill a previously defined ethic of data sharing and to solicit help in "saving the past for the future."

As archaeology became increasingly diverse in the modern era, globally and locally, new people introduced new perspectives, again changing archaeological ethics. This diversity, with influences from the postmodern reflexive "turn" in anthropology and international Indigenous rights movements, questioned the primacy and subjectivity of Western science and encouraged alternative epistemologies, which in turn has inspired ethics of collaboration, reciprocity, and stakeholder dialogue in modern archaeology (as discussed below) and led to greater acknowledgement of the inseparability of politics from scientific practice. Armed with greater knowledge of the modern social contexts of archaeological research, archaeologists have begun to transform their ethics to increasingly focus on people, rather than objects. This transformation has been noted in statements and codes of ethics of professional archaeological societies, such as the World Archaeological Congress (WAC n.d.).

Key Issues/Current Debates

As discussed above, archaeological ethics used to play a minor role in the practices of archaeologists as well as the archaeological literature. Once focused on rules governing the collection and analysis of artifacts, ethics in archaeology is now a major focus of the discipline. Local, national, and international archaeological societies are seeking to engage their members in discussions of ethics, and numerous books have been written on the subject (e.g., Lynott and Wylie 2000; Zimmerman et al. 2003; Scarre and Scarre 2006; Vitelli and Colwell-Chanthaphonh 2006; Colwell-Chanthaphonh et al. 2008).

In this section, key issues and current debates in ethics of archaeology will be presented, organized into a "trinity of responsibilities" first proposed by McGuire (2003: xiii): accountability to the material evidence of the past, to various publics associated with archaeological practice, and to the discipline and colleagues. Quotes from professional archaeological organizations on these responsibilities are provided in Tables 2, 3, and 4.

These responsibilities are not mutually exclusive (see Fig. 3) – they intersect in some of the most crucial modern archaeology debates, including the collection, analysis, and preservation of human remains, the ownership and control of cultural heritage, and the struggle to make archaeology applicable in the twenty-first century and beyond.

Ethics in Archaeology, Table 2 Responsibilities to the archaeological record

Archaeological Institute of America	"As primary stewards of the archaeological record, [archaeologists] should work actively to preserve that record in all its dimensions and for the long term"
Australian Archaeological Association	"Members will advocate the conservation, curation and preservation of archaeological sites, assemblages, collections and archival records. . . [Members] support and advocate the necessity to properly manage archaeological materials in accordance with agreements with communities of concern"
Canadian Archaeological Association	"We expect [members] will exercise respect for archaeological remains and for those who share in interest in these irreplaceable and nonrenewable resources now and in the future"
European Association of Archaeologists	"It is the duty of every archaeologist to ensure the preservation of the archaeological heritage by every legal means"
Japanese Archaeological Association	"Members recognize that the sites, features, and artifacts which archaeology takes as its objects of study are the precious heritage of human history and culture, and strive to preserve and utilize these materials"
Society for American Archaeology	"It is the responsibility of all archaeologists to work for the long-term conservation and protection of the archaeological record by practicing and promoting stewardship of the archaeological record"
World Archaeological Congress	"[Members] acknowledge the importance of protecting indigenous cultural heritage to the well-being of indigenous peoples"

Ethics in Archaeology, Table 3 Responsibilities to associated publics

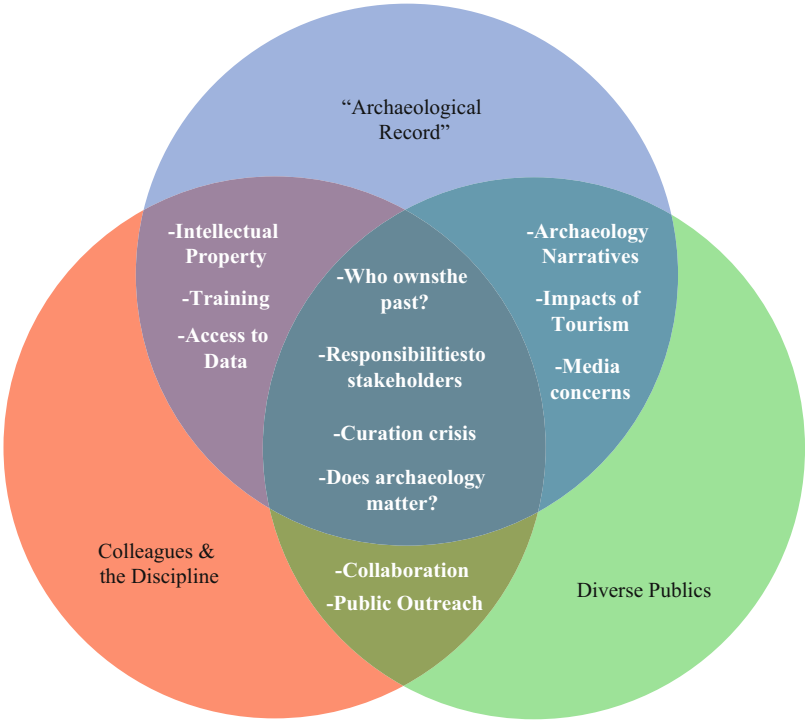
Archaeological Institute of America	"It is the responsibility of professional archaeologists to communicate with the general public about the nature of archaeological research. . .Archaeologists should be sensitive to cultural mores and attitudes, and aware of the impact research and fieldwork may have on a local population, both during and after the work"
Australian Archaeological Association	"Members will negotiate and make every reasonable effort to obtain the informed consent of representatives of the communities of concern who cultural heritage is the subject of investigation. Members cannot assume that there is no community of concern"
Canadian Archaeological Association	"[Members] acknowledge that Aboriginal people have a fundamental interest in the protection and management of the archaeological record, its interpretation and presentation"
European Association of Archaeologists	"Archaeologists will whenever possible. . .carry out prior evaluations of the ecological and social implications of their work for local communities"
Japanese Archaeological Association	"In the conduct of investigation and research, JAA members respect the local history, culture, and natural environment, and give consideration to their relations with the local community"
Society for American Archaeology	"Responsible archaeological research. . .requires an acknowledgement of public accountability and a commitment to make every reasonable effort, in good faith, to consult actively with affected group(s)"
World Archaeological Congress	"Members agree that they have obligations to indigenous peoples and that they shall. . .acknowledge the importance of indigenous cultural heritage. . .to the survival of indigenous cultures"

Responsibilities to the Past

Because archaeological research depends on the availability of archaeological sites and artifacts, and archaeologists believe they make positive contributions to society through their work, archaeologists have long felt an obligation to preserve cultural heritage. Threats to cultural heritage come in many forms, including natural and human forces, such as erosion, flooding, development efforts, armed conflict, and tourism. Most archaeological organizations have statements supporting the protection of the past (Table 2). The Society for American Archaeology (SAA) (Lynott and Wylie 2000: 30, 35) notes that "Stewardship" is

Ethics in Archaeology, Table 4 Responsibilities to colleagues and the discipline

Archaeological Institute of America	"Professional archaeologists owe consideration to colleagues, striving at all times to be fair, never plagiarize, and give credit where due"
Australian Archaeological Association	"Members will treat each other in a professional manner. . .[and] disseminate the results of their work as widely as possible"
Canadian Archaeological Association	"[Members] must keep abreast of developments in their specializations; possess adequate training. . .produce an adequate document. . .respect colleagues and cooperate with them"
European Association of Archaeologists	"Archaeologists will carry out their work to the highest standards recognized by their professional peers"
Japanese Archaeological Association	"[Members] strive to advance their professional capabilities. . .and to conduct their work to the best of their abilities. . .members take every measure to assure safety and hygiene, and respect human rights"
Society for American Archaeology	"Archaeologists must ensure that they have adequate training, experience, facilities, and other support necessary to conduct any program of research. . .consistent with. . .contemporary standards of professional practice"



Ethics in Archaeology, Fig. 3 The "trinity of responsibilities" of archaeologists, with intersecting issues

the "central principle of archaeological ethics," "from which all the other ethical principles are derived."

Responsibilities to the past include a number of key issues and debates. First, increasing numbers of international archaeological projects have led to escalating numbers of sites and objects in need of conservation. This fact has led to a "curation crisis," as infinite space and resources are not available to fulfill this ethical obligation. What should be done to resolve this issue? The continuing responsibilities and behaviors of archaeologists towards currently curated objects also invoke debate. What are the best practices for preserving objects and other forms of data? Who has the right to own or control cultural heritage? When should cultural heritage be removed from museum conservation and repatriated to

descendant or other communities? These questions have led to significant debates over whether the primary ethical obligations of archaeologists should be to objects or people and if all people in the world share an ethic of stewardship defined as preservation of the past. Recent case studies suggest that Indigenous and other communities do not value archaeological sites and objects the same as archaeologists. For example, Zuni Ahayu: da (also called "war gods"), once objects of archaeological and art fascination and study, are meant to decay naturally and not be preserved according to the Zuni – here, the ethical responsibility felt by archaeologists to preserve objects is in direct violation of the wishes of a local affected community.

Responsibilities to Associated Publics

Archaeology is of interest to, and itself affects, a diverse range of publics, including government officials, educators, developers (as employers), Indigenous communities, local communities, and the public (Table 3). Since early in the discipline's history, archaeologists have felt an obligation to share their findings and interpretations with the public, following Santayana's (1905) adage: "Those who cannot remember the past are condemned to repeat it." Indeed, Watkins et al. (2000: 40) go as far as to say that "the products of our research belong to the public." These recognitions have inspired archaeologists not only to publish their findings in a timely manner but also to write for broad audiences. The content of publications and even museum displays is also a subject of archaeological ethics, as archaeological interpretations may have unintended consequences (such as denying the origin story of an ethnic group).

As the Zuni Ahayu: da example above shows, the actions and ethos of archaeologists are not always shared by all publics. Over the last 20 years, archaeologists have increasingly recognized, and themselves studied, the ways archaeology and cultural heritage affect people spiritually, economically, politically, socially, etc. Archaeology today is often as much a process of ensuring and actively creating open dialogue and collaborative engagements with communities as it is excavating and interpreting ancient objects. Collaboration and public accountability are especially central to archaeologists' responsibilities towards Indigenous, minority, and descendant communities. Watkins et al. (2000: 41) note:

> It should not be up to the people we study to ask us to consult with them. Rather, it should be a part of our everyday procedures and pre-research checklist to see to it that we approach those affected groups.

Responsibilities to Colleagues and the Discipline

> Archaeology is a profession, and the privilege of professional practice requires professional morality and professional responsibility, as well as professional competence, on the part of each practitioner. Register of Professional Archaeologists Code of Conduct (2012)

Like any profession, archaeology includes a diverse range of practitioners, as well as complicated issues relating to the definition of professional practice (Table 4). Today, there are recognized standards and behaviors related to being a professional archaeologist and working with colleagues. These include responsibilities to acknowledge the work of others (i.e., do not plagiarize); make findings and data accessible to colleagues in a timely manner (no data hoarding); study and comply with local, national, and international laws; ensure the safety and well-being of colleagues (especially students in field-research contexts); and be properly trained and informed. Part of proper training includes recognition of what resources are necessary to ethically complete an archaeological project (e.g., curation space). The dramatic increase in the number of archaeologists practicing in the private sector has led to new efforts to ensure these ethical obligations are met and to provide professional competency training and oversight.

Adding to the complexity of ethical responsibilities to colleagues and the discipline is the increased diversity of archaeological practitioners in the world today. Many archaeologists feel a

responsibility to make the discipline more diverse and to ensure there is no discrimination in hiring practices, work environments, or educational scholarships. Archaeology is performed on six continents by tens of thousands of people, each with personal value systems and visions of what archaeology's disciplinary foci and ethics should be. New cultural identities, ontologies, and epistemologies in the discipline add depth and complexity to ethical issues.

International Perspectives

> If archaeologists—of all people—can draw some lessons from the past, perhaps we can rediscover a more human side to our science and come to value once again the importance of face-to-face relationships with those whose ancestors we wish to study (Thomas 2000: 276).

Much of the archaeological literature on ethics is written by, or discusses examples from ethical issues including, North American archaeologists. These individuals are not inherently more ethical than archaeologists elsewhere in the world. Rather, as noted by Colwell-Chanthaphonh et al. (2008: 54–55): "Our ethically turbulent present is the result of a history of practice that often ignored – or mistreated – stakeholders, participated in colonial enterprises, and assumed control and ownership of cultural properties."

Ethical issues in American archaeology reflect those in global archaeological practice. Reviewing current news articles and statements of archaeological organizations shows the ubiquity of ethics. Archaeologists responding to looting of and damage to the Baghdad Museum and Iraqi archaeological sites during the recent Iraq War, trying to stop the destruction of the sixth-century Bamiyan Buddhas by the Taliban government of Afghanistan in 2001, testifying before governments to argue for stronger laws to protect and mitigate damage to archaeological sites, rushing to save archaeological sites to be submerged by the Three Gorges Dam in China, and writing letters to protest the sale of human remains and other archaeological objects on online auction websites are all examples of archaeologists enacting their perceived ethical responsibilities to the past and to the people.

Perhaps no ethical case study in American archaeology is more well known than that of Kennewick Man (or "the ancient one") and the related US legislation, the 1990 Native American Graves Protection and Repatriation Act (NAGPRA). Kennewick Man is the name given to a set of approximately 9,000-year-old human remains discovered in Kennewick, Washington, USA, in 1996 (for a detailed history, see Thomas 2000). The discovery of Kennewick Man led to a nearly decade-long legal battle involving many stakeholders, including a coalition of Native American tribes, archaeologists, anthropologists, government officials, local communities, and the general public. The battle centered over whom (if anyone) should have the right and obligation to control Kennewick Man and similar individuals and associated objects from the past. Kennewick Man also fomented extant divisions with American archaeology concerning ethical principles, especially accountability to affected publics and definitions of terms such as "artifact" and "stewardship." Kennewick Man currently resides in the University of Washington's Burke Museum of Natural History and Culture. For some, this result was seen as a victory; others stated that more was lost in the struggle to control Kennewick Man than could have ever been gained through scientific study. Both NAGPRA and Kennewick Man were signs of changing ethos, theories, and practices, among archaeologists, Indigenous communities, and the American public.

North American archaeology has changed dramatically since the passing of NAGPRA. While before, American archaeology was suffering from a myopic focus on stewardship and preservation of the "archaeological record" (an object-based epistemology), today, due to NAGPRA and cases like Kennewick Man, ethos in American archaeology are increasingly people-centered. Kennewick Man reminded archaeologists that many "archaeologies" exist in the world and that

the past has real impacts on people's lives in the present. Discussions concerning stakeholders and these impacts have led to many new principles and spirits in American archaeology, including collaboration, social justice, and reciprocity.

Naturally, there are many other ethical issues and debates about proper practices American archaeology. For example, in February 2012, three archaeological organizations based in the United States joined in writing letters to protest two new television shows ("Diggers" and "American Diggers") that showed excavation as treasure hunting and violated a long-standing archaeological ethic of non-commercialization by discussing the monetary values of excavated "finds." The organizations worried that the television shows would promote looting of archaeological sites, rather than instill an ethic of preservation and stewardship in the viewing public. The "Diggers" shows also reflect ongoing concern amidst American archaeologists for how accurately the media portray scientific archaeology and people of the past.

Future Directions

> The ability to sustain an ongoing process of critical reflection on difficult and ever-changing ethics issues is crucial to the future of archaeology as a profession (Lynott and Wylie 2000: 10).

New trends in archaeological ethics can already be seen by observing the practices of archaeologists in various global contexts. Collaboration with local communities is more frequent today than it has ever been in the past. At professional meetings in the United States, archaeologists often acknowledge the traditional Indigenous people of the land where the meeting takes place and offer warnings before human remains are displayed in presentations. Curators and directors of archaeological laboratories and museums are adapting to include nontraditional and Indigenous curation practices. Archaeological publications increasingly include statements of gratitude to local communities for their support and are beginning to be seen in open-source formats rather than traditional print journals. These are all small signs of what may come in archaeological ethics.

In the future, archaeological ethics is likely to be framed such that archaeologists practice in accordance to societal norms, such as honesty, fidelity, and respectfulness, to the best of their abilities, and to work towards both beneficence ("do good") and nonmaleficence ("do no harm"). In other words, archaeology, like all sciences, should benefit people in the world. The teleological goal of beneficence is likely already shared by all archaeologists. It can be seen in existing ethical norms requiring public reporting of data and interpretations and public outreach. Nonmaleficence is a goal not currently stated in many archaeological principles or ethical codes. Nonmaleficence can only be practiced when one understands the consequences of archaeological courses of actions on all those living today.

In deciding how beneficence and nonmaleficence are reached, archaeologists should recognize that scientific practices, cultural heritage, and ethics are all contextually dependent. Thus, to do good and prevent harm, archaeologists must be aware of the stakeholders affected by their work and recognize that aspects of cultural heritage (including tangible and intangible elements) are ends in themselves and not means to an archaeological end. Many objects and sites have agency – they are ancestors, or signs of ancestors, or they are a part of living people. Their meanings are not defined by archaeologists alone. Also, archaeologists should recognize that existing ethics such as the preservation of sites and objects may not be universally held. While preservation helps ensure future archaeological investigation and knowledge production, if ever people are in some way harmed by "archaeological" preservation methods, preservation would be found to be unethical. Perhaps, then, the focus of archaeological ethics should be an appreciation of an argument for the view that it is important and valuable to modern society to learn about (and from) the past, in all its versions, using any methods deemed appropriate by those involved (Zimmermann 2006).

Inevitably, there will be ongoing conflicts and disagreements over how "best" to practice archaeology in the future. As the quote above suggests, ethics is mutable and will change. Thus, ethical practice of archaeology requires ongoing

discussion, debate, and compromise among all those who participate in global archaeology.

Cross-References

- ▶ Conservation and Preservation in Archaeology in the Twenty-First Century
- ▶ Cultural Heritage Management and Native Americans
- ▶ Descendant Communities in French Guiana: Amerindians
- ▶ Field Method in Archaeology: Overview
- ▶ Kennewick Man Case: Tribal Consultation, Scientific Studies, and Legal Issues
- ▶ Local Communities and Archaeology: A Caribbean Perspective
- ▶ Sacred Site Conservation and Preservation
- ▶ Sacred Sites in Indigenous Archaeology

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Ethics of Collecting Cultural Heritage

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Introduction

Perspectives on rights and responsibilities related to studying, collecting, and owning cultural artifacts, or objects of cultural heritage, are at the heart of many debates among scholars, collectors, descendant communities, institutions, and governments. The loss of cultural heritage due to looting, war, development, and other destructive forces has led to a body of laws, international conventions, and other protective measures, particularly since the mid-twentieth century, and has helped shape the codes of ethics that inform how archaeologists, museum professionals, and heritage managers do their work (Lynott 2003).

Definition

Cultural objects from the past are variously referred to as "antiquities," "cultural property," "cultural resources," and "cultural heritage," with usage changing over time and often weighted with political and social subtext. These terms reflect different understandings of ownership, value, and meaning. They suggest whether we think first of preservation or ownership, culture or aesthetics, science or humanism. These concepts, and their relationship to archaeology and the ethics of collecting artifacts representing past times and – usually – the "other," are discussed by many scholars, including Vitelli (1996), Messenger (1999), Hoffman (2006), and Robson et al. (2006).

The term "antiquities" refers to objects or relics dating from ancient times, originally thought of as preceding the Middle Ages. These were generally the things that antiquarians studied, collected, and dealt in. Over time, the terms for both the objects and the people who study them have become more nuanced as specialized fields of study, including archaeology and art history, have developed.

The term "cultural property," widely used in legal and political discussions, is generally considered to include objects of an archaeological, ethnological, and artistic nature, with cultural or historical significance. Use of the term "property" suggests a Western perspective that ownership can be established, either as favoring a particular "source" nation, such as Mexico, Peru, or Cambodia, or the entity best suited to conserve an object for humanity, often – at least until recently – a "market" nation, such as the United States, the United Kingdom, or Japan. This is often referred to as the cultural nationalism versus the cultural internationalism argument. Numerous authors, including Merryman (2005), Carducci (2006), Gerstenblith (2007), Bauer (2010), and Forrest (2010), present legal perspectives on the debate, including discussions of the interplay between national and international laws. Carman (2005) and Renfrew (2000), among others, discuss the intersection of value, ownership, property, and archaeological categories.

The term "cultural resources" has been used commonly since the 1970s, especially in the United States, in the context of the management of archaeological sites. The field of cultural resource management, or CRM, grew out of the specialized practices developed to comply with national laws designed to protect archaeological and historic sites. The term "cultural heritage," introduced in the 1972 UNESCO World Heritage Convention, has gained favor as a broader and more inclusive term that seeks to avoid connotations of exploitation and extraction, as discussed by Burke & Smith (2010). This term is also used increasingly in the texts of international conventions and agreements. The more neutral term, "cultural objects," has also been used to emphasize the ability of objects to be physically possessed, moved, and returned, as discussed by Vrdoljak (2006: 7–8).

The way we identify the trail of possession of an object is also weighted with meaning. The art world typically uses the term "provenance" to document the authenticity and ownership chain of a work of art from the point of creation or discovery to acquisition by a museum or collector, whereas archaeologists use the term and its variant, "provenience," to emphasize the object's original context, which is an essential component of the archaeological record. Robson et al. (2006) discuss this issue from multiple perspectives.

When we consider the "ethics" of collecting, we think in terms of a set of moral principles or values that guide our actions. Wylie (2003) describes the ideas and processes underlying the development of ethical standards, in contrast to legal standards. An ethic articulates a set of ideas that allow us to judge existing practices, usually to even tighter standards than a law might do. Because ethical principles and codes of ethics are based on ethical intuitions and moral judgments, Wylie argues they must be seen as works in progress that involve active, ongoing reflective debate.

Historical Background

History of Collecting and the Development of Laws

Objects that are made or used by a particular cultural group become part of a collection when someone – often from a different cultural group – makes subjective choices about acquiring and sorting them and gives them value and meaning beyond their original intention. Thomason (2005) discusses the theoretical underpinnings and definitions of collecting, which she places at the intersection of archaeology and material culture studies. The human impulse to collect objects from other cultures, and even to exhibit them in a sort of museum, goes as far back as ancient Mesopotamia, some five millennia ago, she argues. Other cultures, from the Greeks to the Aztecs, also left evidence of their fascination with past cultures in their own caches and collections of venerated objects from the ancestors.

Hoffman suggests that Western origins of the idea of art and cultural heritage preservation as a matter of public concern can be traced back at least to late-eighteenth-century France when the revolutionary government wrestled over whether to destroy all traces of Latin inscriptions on monuments and other "tainted art" (Hoffman 2006: 1). Asked to create the argument for preservation, Abbe Gregoire identified the existence of a "national patrimony" that was represented in part by artifacts and monuments of antiquity as examples of the genius and talents of their creators. With this focus more on the creators than on the patrons of the time, he argued that these works should be preserved – not destroyed or sold abroad. Hoffman brings this argument that "culture matters" to the concept of "common interests" that are widely shared globally.

Many countries have developed laws protecting their national heritage. In the United States, the 1906 Antiquities Act was the first federal policy to preserve historic and prehistoric sites on federal lands. Soderland (2010) provides an overview of the first century of US laws to protect archaeological and historic sites, including the 1966 National Historic Preservation Act, the Archaeological Resources Protection Act of 1979, and the 1990 Native American Graves Protection and Repatriation Act (see also Messenger 1999; Zimmerman et al. 2003). US regulations also address international cultural resources, such as the National Stolen Property Act, and regulations on smuggling or transporting stolen goods into the country, all of which have been used to prosecute cases involving movable archaeological materials. Other countries have similar sets of laws and regulations that have grown out of particular political, cultural, and intellectual traditions, as discussed by Brodie et al. (2001), Hoffman (2006), and Messenger and Smith (2010).

During the nineteenth and early twentieth centuries, museums became the repositories of the ancient objects that represented earlier human achievement, both utilitarian and artistic, as discussed by Vrdoljak (2006: 47–72) and Roberts (2006). Early archaeologists, probably as much the antiquarian and collector as anyone else, pored over glass cases of objects seeking to

develop typologies that would show the gradual and systematic development of human civilization. From the 1930s to 1960s, archaeology was in transition from a largely amateur pastime, in which famous archaeologists such as Graham Clark found themselves drawn to the archaeological study of the past as "passionate connoisseurs" of objects, into a highly specialized scientific discipline (Fagan 2001: 1). The first two-thirds of the twentieth century saw major expeditions and excavations of sites by universities and museums, often with the backing of wealthy donors, in such places as Angkor Wat, the Maya lowlands, and Machu Picchu. There was a strong emphasis on building the collections of major museums as repositories of world heritage, as discussed by Forrest (2010) and others.

After World War II, as the field of archaeology developed into a scientific discipline, the emphasis shifted away from expeditionary artifact collecting to the systematic study of sites and contexts. With a myriad of interdisciplinary research strategies at hand, archaeologists increasingly realized the promise of using the archaeological record to reconstruct the story of the past – learning about diet, climate, trade, migrations, and much more, through residues in pots; soils in the matrix around artifacts; the context of objects and buildings, in particular, landscapes; and chemical analysis of bones and teeth, in addition to the systematic analysis of artistic styles and inscriptions. Being able to carry out archaeological research in a given country depended on a complex network of governmental permits and support from universities and foundations as well as the ability to prove competency through research reports and publications in an increasingly professionalized field.

As this potential for expanded scientific analysis grew, the levels of site destruction, looting, and the international trade in antiquities were reaching crisis proportions around the world, despite the existence of many national laws designed to protect sites and artifacts. The damage to cultural heritage as a result of looting is discussed by Elia (1996) and Brodie et al. (2001).

The emergence of UNESCO in the 1950s as a forum for international cooperation through its social and cultural programs provided new opportunities for addressing these concerns, according to Long and Labadi (2010), especially through the five conventions focused on protecting world heritage. The 1954 Hague Convention established recognition of the universal importance of cultural heritage (Forrest 2010: 406). The 1970 UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export, and Transfer of Ownership of Cultural Property established a protocol for international cooperation to address this crisis. As individual nations ratified the 1970 convention, they could request assistance from other States Parties. The United States ratified the convention in 1983 with the US Convention on Cultural Property Implementation Act, which provides mechanisms for bilateral agreements to restrict the import of endangered cultural materials from other countries. With the subsequent ratification by other countries considered to be major destinations for international art and objects of cultural heritage, the 1970 UNESCO Convention now has considerably more potential to be effective. Other conventions, laws, and agreements have been developed to further clarify and strengthen the legal protections available, as discussed by Robson et al. (2006) and others. The 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage established the World Heritage List, along with the protocols and procedures for selecting, preserving, and protecting cultural and natural sites considered to have outstanding universal value. It is one of the most widely accepted conventions with 186 States Parties supporting it, in part for the opportunity to promote nationalist agendas at sites designated as World Heritage Sites. By 2011, there were more than 900 sites on the list, with many more nominations being developed at the regional and national levels. The concept of a shared world heritage that led to the World Heritage List and that is at the core of the argument for universal museums is critiqued by Scarre and Scarre (2006), Labadi and Long (2010), and Forrest (2010).

The UNESCO cultural heritage conventions are important within their spheres of influence, yet are limited by uneven acceptance by

individual States Parties and by differing interpretations and enforcement of their norms. Nevertheless, as Forrest concludes (2010: 422–423), their emphasis on education and international cooperation has made significant contributions to the protection of cultural heritage through development of international laws and the increased diffusion of knowledge about our shared world heritage.

Codes of Ethics

It is not surprising that codes of professional ethics for archaeologists have undergone significant revisions and updates in order to address issues related to the ethics of collecting, including stewardship of cultural heritage, the commercialization of objects, the need for more extensive communication, and closer scrutiny of ethical issues in research and publication, including guidelines regarding the use of unprovenienced objects. Archaeology as a profession needed a new set of normative principles that clearly laid out what archaeologists' responsibilities should be to the archaeological record, to diverse publics, and to colleagues, employees, and students, as discussed by Lynott and Wylie (2000) and Zimmerman et al. (2003: xiii-xvi). Examples of codes of ethics revised in the 1990s and early 2000s as the result of long consultative processes can be found on the websites of the Society for American Archaeology, the Archaeological Institute of America, and the European Archaeological Society, among others. And as Wylie has discussed, they will continue to evolve as professional practices related to objects of heritage change and mature.

Current Debates and Future Directions

While laws and conventions provide legal frameworks for protection and ownership of objects, the ethical debates continue, addressing issues related to multiple stakeholders, including indigenous and descendant communities, the use and treatment of objects and control over them, repatriation of human remains and sacred objects, changing authority over objects in museums and collections, and economic issues ranging from subsistence digging to curation to valuation of cultural objects. Professional archaeologists continue to debate ethical issues related to the use of undocumented and unprovenienced objects in their research, and museum curators wrestle with making ethical choices related to acquisitions and possible restitution of objects to their country or culture of origin.

Professional organizations and international bodies are working to find new models to address ethical issues beyond the scope of laws. The International Council of Museums (ICOM), for example, in its 2007 general assembly passed resolutions, including Resolution No. 4, "Preventing Illicit Traffic and Promoting the Physical Return, Repatriation and Restitution of Cultural Property." This resolution urged all countries to make the fight against the increasing illicit traffic of cultural and natural resources a priority. The International Council on Monuments and Sites (ICOMOS), one of three nongovernmental organizations that serve as advisors for the UNESCO conventions, plays an ongoing role in monitoring sites on the World Heritage List and reviewing requests for assistance among States Parties to the conventions. ICOMOS also promotes discussions of emerging issues, such as the protection of intangible heritage in addition to tangible heritage.

Another perspective on the seemingly unresolvable differences related to collecting and owning objects of cultural heritage came from C. Brian Rose, president of the Archaeological Institute of America, in a 2007 letter published in *Archaeology Magazine*. Acknowledging the different perspectives that many in the museum community have from many archaeologists relative to the purchase or analysis of undocumented artifacts, he called for finding, if not a common course of action, then consensus on programs aimed at preventing the plundering of artifacts and their illegal removal from the countries of origin.

Perhaps collaborative work on such programs might lead to an ethical standard that all could agree on.

Cross-References

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- Cultural Heritage Management and the Colonial Culture
- Cultural Heritage Site Damage Assessment
- Ethics in Archaeology
- Heritage Ethics, Cultural Base of
- Heritage Valuation: Paradigm Shifts
- Heritage, Changing Views of: A Legal Perspective
- International Conventions Pertaining to Heritage Policy: Introduction
- United States: Cultural Heritage Management
- Vandalism and Looting (Ethics)

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Further Reading

Archaeology Magazine for discussions of recent court cases and examples of restitution of cultural objects.

Codes of ethics on websites of professional archaeological organizations (including Society for American Archaeology, Archaeological Institute of America), and

international organizations, such as the International Council of Museums (ICOM) and the International Council on Monuments and Sites (ICOMOS).
International Journal of Cultural Property
Journal of Field Archaeology
Publication series, including Duckworth Debates in Archaeology; Perspectives on Collecting, Ashgate Publishing Co.; Key Issues in Cultural Heritage, Routledge; Research in Museum Studies, Routledge; One World Archaeology Series; World Archaeological Congress Research Handbooks in Archaeology.
Websites for UNESCO conventions on cultural property, tangible and intangible heritage.
Website of U.S. Department of State Cultural Property Advisory Committee and corresponding governmental agencies of other countries.
Writings of foundational leaders in the field, including Henry Cleere, Clemency Coggins, David Lowenthal, Patrick O'Keefe, Lyndel Prott, Colin Renfrew.

Ethics of Commercial Archaeology: Australia

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Introduction

Having recently returned to full-time employment in commercial archaeology after a period of 7 years in academia, the ethics of commercial archaeology is a subject at the forefront of my mind. A lot has been written about the ethical issues involved in indigenous heritage especially the scenario where non-indigenous practitioners and regulators are making decisions regarding the heritage of indigenous people (e.g., Langford 1983; Byrne 1993, 1996; Smith 2004). The ethical dilemmas are obvious in that context; however, while this entry touches on this area, it focusses more broadly on a range of ethical issues including those relevant to the often less-critiqued area of non-indigenous heritage also referred to as historical heritage or the heritage of settler societies. In such fields the archaeologist is often of the same cultural (or a derivative) background as the people who created the heritage. They therefore have a privileged role in studying the cultural remains as insiders, but to some extent since archaeologists are dealing with the heritage of past societies, are we not always at a fundamental level "outsiders"? This entry adopts a consciously provocative stance in highlighting many of the issues that face those working in commercial archaeology in Australia; while doing this I acknowledge that there are archaeologists in Australia who are conscious of many if not all of the issues raised and who attempt to address these in their daily practice, and I also acknowledge that we are all to a greater or lesser extent constrained by the economic and regulatory framework in which the industry operates.

Definition

Commercial archaeology is not a term widely used in the Australian context. It is used here to encompass all areas of archaeology with a commercial basis. By extension this includes the consultant archaeologists, the archaeologists employed by the regulating government authorities whose work is now in most states largely to service the development driven consulting field, and those archaeologists employed directly by companies, agencies, and government corporations that have a development focus. I have further extended it to include the parts of the academy that are increasingly constraining their academic offerings to those which are commercially popular and defining their degree content to provide fodder for the consulting industry.

Key Issues/Current Debates/Future Directions/Examples

In Australia the ethical dilemmas for commercial archaeologists have been discussed since the emergence of the consulting field in the early 1980s (Smith 2004). However, the industry itself, largely via the Australian Association of Consulting Archaeologists Inc., has been from the start

highly self-reflective with debates about ethics and standards, especially throughout the 1980s and 1990s through an active program of lively debates at occasional meetings and a regular newsletter. However, the late 1990s and the first decade of the 2000s have seen a rapid increase in the number of archaeologists in Australia largely linked to the development boom. Most of these have not joined the professional association established specifically for consulting archaeologists and while there are other relevant associations such as the International Council for Monuments and Sites (Australia ICOMOS), the Australian Archaeological Association (AAA), most have not joined these either. Where then are these practitioners finding the mental space to appraise their practice let alone opportunities to engage in the big ethical debates?

In the Australian context the big ethical debates have been largely sidelined in favor of recipe-driven methodologies and business-like expediency. This is generally true throughout Australia despite the variation in heritage legislation across the states. Several questions need to be constantly addressed by archaeologists working in the commercial area. The first big ethical question is still: *What's it all about Alfie*? (Bacharach and Hal 1965). What is the purpose of archaeology in Australia? Are we here to attempt to answer (or contribute to answering) the big questions about our past, and the settlement of the continent, or is our purpose to collect data and compile large collections of gray literature reports about places that we have helped destroy? This leads to the second big question for archaeologists in Australia: *Do we ever save anything anymore*? Around 85% of all the places that are excavated and recorded by commercial archaeologists are subsequently destroyed, the destruction sanctioned by the very government agencies charged with the protection of heritage in each state. While this then means that around 15% are "saved," it is not necessarily clear that these are the most significant sites rather than just the ones that the developer did not need to destroy. Perhaps archaeology graduates spill out of the academic floodgates understanding that their rightful place is as a cog in the wheel of the planning and development process, but for some of us this is a question that weighs heavily on our minds. The third big question has existed in Australia since the emergence of the discipline and is not restricted to the area of commercial archaeology: *How is the information that we generate used*, *by whom is it used*, *and to what end*? This has long been a concern of Aboriginal Australians and advocates who have argued that Aboriginal people need to retain control over archaeological information relating to their past (Langford 1983; Byrne 1996). However, it is increasingly obvious that it is not only Aboriginal Australians whose history is at risk of manipulation (Ireland 2003). Whoever controls information can "construct" the past of their choosing. The idea in Australia of a government-sanctioned past has in recent years gained notoriety with the Australian "History Wars" reported widely in the media. Combatants in these wars have included past Prime Ministers Howard and Keating and a range of historians and prominent public figures.

Backpacker Archaeology

Over the past decade a subfield of archaeologist has emerged in Australia consisting of archaeologically trained personnel who refer to themselves as "diggers." In the past working on other people's large excavations was something one did partially for the experience of working on a large site but also to gain experience with the idea that one might one day be responsible for such an excavation. However, now there are large pools of people who eschew the responsibility of running any archaeological projects and move from dig to dig like itinerant fruit pickers. This seems to have developed from European models especially the United Kingdom and Ireland, from where some archaeologists emigrated when the development boom began to slow there. Of course in itself this is not necessarily an ethical problem, but it does give rise to several questions of ethics that need further thought. What responsibility do individual archaeologists bear for the conservation of heritage places in this scenario? And what mechanisms are in place to ensure that we are not all unconsciously working to maintain an industry that serves no higher purpose for society. Is there

a shared "archaeological ethic" across this archaeological workforce? Perhaps employers and those who control permits should make membership of one or more of the major associations mandatory to ensure that archaeologists commit to a relevant code of ethics.

The idea of pool of archaeological "diggers" is made plausible by the belief that archaeology can be reduced to a technical science model (see the discussion below regarding processual archaeology). The ultimate extension of this is the abandonment of the requirement for university degrees and the development of technical short-course qualifications. Unfortunately, this would mean that the complex research questions and philosophical frameworks that archaeological research can contribute to would ultimately be ignored.

A Fourth "Voice": The Voice for Archaeological/Heritage Places

An archaeologist working in the commercial archaeology field can often find themselves adopting a stance (or being accused of doing so) that aligns them with one or other of the sides of the development and heritage triangle, i.e., the developer or the regulator and – in case of indigenous heritage – the Aboriginal community. In 1985, Isabel McBryde edited a collection of papers under the title, *Who Owns the Past*? 27 years later a Google search of that term reveals that this question is still being asked of archaeologists and by them. In regard to Australian Aboriginal archaeological sites, it is a question that has often been answered by acknowledging that Aboriginal people should own and control the relics of their past. In the case of our more recent colonial past, where the question is asked at all, the assumption is often that the heritage agencies represent the interests of the community and therefore can legitimately speak for these sites. In reality where they have the opportunity to express opinion this is often contested by local communities or interest groups.

I fear we have taken an easy road. Who speaks for the dead and their legacy to our society? Surely archaeologist should represent a fourth "voice" and speak for the relic, the site, and the legacy. This is not necessarily to say that this voice would have any primacy over the others, and certainly it should not be equated with some outdated notion of antiquarian ownership, but it should be voice that is projected loud and clear and a voice for research and conservation. It is the voice that is largely silent in Australian archaeology subjugated beneath the weight of economic rationalism and ultraconservatism. As resources are progressively withdrawn from heritage agencies and fewer staff are retained to struggle with large regulation-based workloads, there is little time and few opportunities for staff archaeologists to sit back and think about different approaches. It is therefore especially important that all archaeologists involved in commercial archaeology resist and challenge the new orthodoxy – the guidelines, standards, and proformas that are developed to improve archaeological outcomes across a broad range of circumstances but over time often stagnate and stifle creative new methodologies and options for research and conservation. It is essential that this resistance and challenge is a positive process and that it generates new, improved solutions, ideas, and outcomes.

The Stagnation of Community-Based Approaches

In 1996 Greer developed the concept of community-based archaeology. Over the next decade Australia became something of a leader in this area (Marshall 2002), but we now have to ask ourselves, has the application of this approach stagnated into a recipe of public open days on excavations and the routine production of brochures and websites? Edwards-Ingram (1997: 27), although speaking in the US context, comments on the public's misunderstanding of what archaeologists do but nevertheless describes the relationship between archaeologists and the public as "interactive and increasingly reflexive." Fifteen years on, archaeologists in Australia as elsewhere are still complaining that the public does not understand them, laying the blame at the feet of romantic sensational portrayals of archaeologists via Hollywood figures such as Indiana Jones. If the discipline had embraced the community-based approach, then the "community" would be a partner in the archaeological

enterprise. As recently as 2002 (Greer et al.) I, along with colleagues, espoused a positive view of the future of community-based approaches, although we carefully differentiated such approaches from "consent-based" community involvement in archaeology. Today, however, little progress in this area is evident.

The Dominance of Processual Theory and Practice in Commercial Archaeology

The ethical dilemmas inherent in the unthinking adoption of a processual archaeological framework are myriad (see Smith 2004). Firstly, the adoption of the processual approach would not in itself be problematic if archaeologists at least understood that this was what they were doing and were aware that other theoretical frameworks exist which merited consideration. However, most practitioners cannot even articulate this theory (or any alternative theoretical framework). The blame for this I lay squarely at the feet of our academic institutions and their conscious or unconscious alignment with commercial archaeology which has led many of them down the path of feeding the current system.

The dominance of this theory which embraces positivist logic and an unthinking adoption of scientific (like) methods has led to some alarming decrees. For example, NSW Requirement 16 of the Archaeological "Code of Practice" developed by the Office of Environment and Heritage (DECCW 2012) specifies the use of 50 × 50 cm squares for test pits for all Aboriginal heritage test excavations. Further, it specifies that these have to be placed on a systematic grid across the landscape or site and that any test excavation point must be separated from another by at least 5 m. No explanation is provided as to how this promotes a good outcome for the archaeological site or why it has merit over other testing methodologies. Many years ago Mulvaney (1981: 25) cited the even older source (Collingwood 1944: 85) as an illustration that "the problem of research design is not a new one," and he went on to say that "It is encouraging that problems have been recognized so early in the development of public archaeology in our region" (p. 26). The issue of research design in commercial archaeology remains problematic with regulatory control ranging between Australian states from absolutely no control to overly restrictive limitations that obstruct scholarly practice.

The Role of Universities

In the past the academe has been one of the places where the philosophy and history of the discipline have been reflected on and discussed. In the past two decades, it has developed into another branch of commercial archaeology, one where students are increasingly seen as consumers (Colley 2005) or customers that need to be "satisfied." This is response to increasing pressure on departments to attract more students to maintain basic funding levels as well as demonstrating direct connectivity between courses offered and post-university employment. One of the outcomes of this is that one can no longer assume that critical scholarship within the academe will generate the theoretical and philosophical debates that can inform the development of an ethical industry. Some would argue that the concept of the academe as a place where ideas can be developed, debated, and challenged is outdated and has been replaced by "Edutainment" where students determine what they want and can buy it off the shelf. The ethical issues embedded in a higher education system that focusses on the commercial and devalues the humanities and social sciences are a major discussion outside the scope of this entry.

Most archaeologists working in Australia today are "commercial" archaeologists in the sense that their work, opportunities, and funding area are somehow dependent on a paying clientele and subject to market forces. This is true of archaeologists working in consulting companies, heritage agencies, corporations, and those teaching in universities. Archaeologists with full-time research positions are increasingly rare. To date the development of commercial archaeology sector in Australia has not resolved any of the major ethical dilemmas that it faced at its inception. To some extent resolving them may not be as important as the practicing of reflection, recognition, and debate through which we try to resolve them – a disciplinary state of "mindfulness" (cf. the Buddhist principle). The question is do we still have an environment in Australia that is conducive to such reflective practice?

Cross-References

- ▶ Ethics and Human Remains
- ▶ Ethics in Archaeology
- ▶ Ethics of Commercial Archaeology: Brazil
- ▶ Ethics of Commercial Archaeology: Japan
- ▶ Ethics of Commercial Archaeology: Nigeria
- ▶ Ethics of Commercial Archaeology: Southern Africa
- ▶ Ethics of Commercial Archaeology: USA

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Ethics of Commercial Archaeology: Brazil

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Introduction

There are two distinct speeches in Brazilian archaeology, an official discourse and an unofficial discourse. In the official discourse, spoken at conferences, in publications, and in classrooms, everything is fine. There are jobs for everyone, archaeological work is being performed, and cultural heritage is protected. Unofficial discourse, comprised of informal conversations that take place in the corridors of Congress, outside the classroom, during the fieldwork, says just the opposite, i.e., that chaos is installed in Brazilian archaeology. The chaos in this case has a name, Contract Archaeology or Commercial Archaeology.

As happened in many other countries, the growth of commercial archaeology in Brazil also resulted in a change in archaeological practice; the difference is that in the Brazilian case, the change was radical. The numbers are impressive. It is estimated that commercial archaeology in Brazil represents about 90% of all archaeology practiced in the country, handling more than 70 million dollars per year and using more than 3,000

professionals, directly or indirectly (Zanettini 2009). We talk about continental numbers in a continental country. To understand the gravity of the problem of commercial archaeology in Brazil. Just think that while about 30 permits for archaeological research were issued per year in the 1990s, in 2011, more than 900 permits for archaeological research were granted. And the numbers tend to increase, especially with the works associated with the Economic Acceleration Plan of the Federal Government, with the World Cup in 2014, and with the 2016 Olympics.

But despite all this growth, most archaeologists in Brazil have given little attention to discussions of the ethics associated with archaeological practice. To understand this apparent disinterest, we first need to understand that what motivated this significant increase in archaeological research was not an awareness of the importance of archaeological heritage, but changes in environmental legislation, which since the late 1980s have forced entrepreneurs to license works that will potentially modify the environment. In a country like Brazil that is in the process of economic growth, with infrastructure works scattered throughout the national territory, forcing entrepreneurs to conduct archaeological licensing so that they might obtain authorization for the installation and operation of projects resulted in an explosion in the amount of archaeological work. Was Brazilian archaeology prepared for this radical change? The answer is no, it was not. The problem is that the change in environmental legislation that forces developers to perform archaeological licensing was done without serious consideration of three basic aspects: regulation of the profession of archaeologist; minimum criteria required for each stage of licensing archaeological work; and infrastructure of government agencies to oversee the archaeological work and law enforcement.

Key Issues and Current Debates

A detailed analysis of the structure of Brazilian archaeology shows us that the government agencies responsible for management of the archaeological heritage, in this case the Institute of National Historical and Artistic Heritage (IPHAN), was not and is still not prepared for the growing amount of research. The lack of Federal Government support has led to the IPHAN failing to meet its obligations, especially with regard to the monitoring and preservation of archaeological heritage. There is an insufficient number of professionals to analyze research projects, a lack of professionals to oversee the implementation of the work, missing cars, and even a lack of gasoline. Given the lack of resources and IPHAN omission of the Federal Government, many archaeological sites throughout the country are being destroyed. The fact that many entrepreneurs are still disrespecting legislation is precisely due to this lack of infrastructure of the Federal Government. The Government created the archaeological licensing law, but forgot to provide IPHAN with conditions to monitor compliance of the law.

At the same time, archaeology as a profession is not regulated in Brazil. This is due not only to the large bureaucracy involved in the process, but also to the lack of organization and interest of archaeologists at many moments. As there is no regulation, we don't know who is or isn't an archaeologist in Brazil. Thus, any Brazilian citizen may apply for a permit for archaeological research. Often we see lawyers and businessmen asking for permission to search. Evidently, the IPHAN tries to prevent this practice by requiring minimal academic background, but in principle, the law guarantees equality to all citizens. At the same time, the lack of regulation of the profession allows large archaeological companies to hire archaeologists while paying ever lower wages and submitting them to increasingly stressful work schemes.

Another problem is the lack of minimum criteria for the execution of the work and archaeological research. In Brazil, there is not a minimum code of conduct that could be used to guide the research. So every archaeologist does what he wants when he wants, in the name of scientific freedom. As there are no basic rules for archaeological procedures in commercial archaeology, the market that dictates the rules, and the rule of the market is clear: cost versus benefit. Thus,

fieldwork practices are reduced to simple collection, and laboratory practices are reduced to analysis on the production line. Most archaeological companies pay for each shovel test in the field and for each artifact in the laboratory. Part of this problem is associated with a patrimonial vision of archaeology, and in particular, Brazilian archaeology that focuses on material remains above community and knowledge. If we think that the record itself does not exist, that material remains of fragmented social practices of the past are re-appropriated and re-assigned significance, we see traces of the past that have no intrinsic value, but a value that is built through the practice of archaeological science, social practices, and cultural policies of the present. As emphasized Hamilakis (1999), we should be more concerned with the remnants of the social memory of humanity and with respect for those who are gone, than with the physical trace itself. Considering the physical preservation of remains to be most important, above accountability to the present and the communities at present, is quite problematic. We must not forget that as archaeologists, we are producers of culture and have contributed directly to the establishment of "systems of absolute truths." Truths are buildings that meet a specific purpose or interest. Since many archaeologists today believe that the record is not a truth that is given (Edgeworth 2003), or something pre-existing that is just waiting to be discovered (Lucas 2001; Tilley 2004), but is something constructed through the practices of science and discourses of identity and power, we recognize that our responsibility goes beyond the physical safeguarding of material evidence (Hamilakis 1999). This patrimonialist vision of archaeology also features the Brazilian IPHAN, which works more like a notary than as a managing agency of archaeological heritage. For IPHAN, a way to certify the quality of a work is to verify the numbers: the numbers of soil surveys and interventions that were carried out in a survey, the number of material remains collected from an excavation, the amount of archaeological remains analyzed, etc. At the end, the numbers and not the quality of interpretation assign credibility to the work.

This concern with the quantitative aspect of research resulted in the development of a very specific literature: research reports. Chadwick (2003) and Bradley (2006) have discussed how the practice of contract archaeology led to the creation, both in England and in the United States, of a very specific literature with its own rules, called project reports. This is a reality that also applies in Brazil. In the reports, detailed narratives and interpretive constructs were replaced by summary descriptions. The narrative takes the position in the third person, not by a stylistic issue, but a by legal one, since the third-person discourse prevents the assigning of ethical and legal responsibilities. There is no correlation between the data. There is no attempt to build knowledge. On the other hand, there are numbers, lots of numbers.

Part of the problem with commercial archaeology may be associated with the formation of professionals in archaeology. In many countries, much attention is given to teaching techniques and practical field knowledge, while little attention is paid to discussions on the ethical responsibilities of this practice (Beaudry 2009). In Brazil, the situation is more problematic, since the vast majority of undergraduate courses in archaeology were created precisely to meet market demands. The teaching of ethics in archaeology in Brazil gets diluted in the different subjects, according to the willingness of different teachers. In undergraduate courses, fieldwork learning is often impaired by the lack of structure of the courses. In Brazil, the vast majority of graduate students in archaeology learn archaeological practice within the commercial archaeology taking place at the school's archaeological sites. Thus, a practice that is based on cost-benefit ratios, standardization and widespread indiscriminate collection perpetuated. There are profound ethical issues in this relationship between universities and businesses contracts. Firstly, because it ensures supply of trained manpower to the archaeological companies, and at the same time, companies pay cheaper salaries to the students, and so have more profit. Students are trained by the companies, since most universities do not have funds for fieldwork for academic training, and do not question the practice of commercial archaeology, considering this

natural. So there is not much space for discussion and criticism of the responsibilities and ethics associated with this practice.

In Brazil, too little is said about the fact that about 70% of all commercial archaeology contracts are concentrated in the hands of only four archaeological companies, some of which do not have archaeologists as owners. By having a greater economic capital, these companies can manipulate the market by controlling and even preventing access and growth of other archaeological companies. At the same time, to be able to compete with large companies, small companies lower the cost of projects, thus impairing performance of the work. The creation of a code of conduct could solve this problem, but unfortunately the Code of Conduct following debate still has not been implemented (Lima 2002). The only reference Brazilian archaeology has for the ethics of archaeological practice is the Code of Ethics of the Brazilian Society of Archaeology, but this does not specifically mention the work of commercial archaeology.

Future Directions

Two aspects need further discussion: public involvement in archaeological research and the ethical commitment of the archaeologists involved in the work of commercial archaeology.

As evidenced by Funari et al. (2008), in the Brazilian case, one of the major ethical issues is related to the inclusion of the public in archaeological practice. Cutting costs and tighter times resulted in the exclusion of researchers, local communities and volunteers in archaeological projects (Bradley 2006). Activities with the cooperation of local communities, alternative sectors of society and other researchers are usually the first cut during the rationalization of financial costs of projects (Chadwick 2003). Society cannot be seen as a passive agent; the public is not just waiting for our theoretical knowledge about its historical and socio-political situation. These things are directly intertwined in his the public's own critical reformulation ofin political negotiation and in its formulation of theories and interpretations. Thus, exclusion of formation processes of knowledge is especially damaging to archaeological practice. At the same time, how can we expect knowledge to be passed to the public, if the archaeological community does not have access to reports produced within commercial archaeology?

One final question remains. To what extent do the archaeologists involved with commercial archaeology have autonomy and the right to criticize the projects they are working on? Does any archaeologist feel free and able to prevent the installation of an enterprise? This question arises from a simple observation: while the archaeologists involved with commercial archaeology are defending the cultural and archaeological heritage, they are paid to defend the interests of the different companies seeking environmental licenses to carry forward their ventures. At the same time, to accept the terms of market competition, most archaeologists are subject to practices that they recognize themselves recognize as unfit. To what extent should we submit to market practices? Moreover, is the concentration of many contract projects in the hands of a few not damaging to knowledge? Does anyone really believe that a company that manages 20, 30, or 50 archaeology projects per year is actually doing science? Obviously, there are serious research projects in commercial archaeology in Brazil, but these are not yet the majority.

Today, we are living in a period of transition. In the governmental sphere, creation of the National Centre of Archaeology aims to facilitate the monitoring and surveillance of archaeological research. At the same time, conferences and forums have recently been created to discuss the regulation of the profession of archaeologist, as well as the practice of commercial archaeology in Brazil. This shows that there is a light at the end of the tunnel.

Cross-References

- ▶ Archaeological Licenses
- ▶ Brazil: Cultural Heritage Management Education
- ▶ Cultural Heritage Protection: The Legal Sphere

► Indigenous Peoples, Working with and for
► Public Archaeology, The Move Towards

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Ethics of Commercial Archaeology: Japan

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Introduction

At present, Japan, a country inhabited by 128 million people, has over 440,000 registered archaeological sites (Agency for Cultural Affairs 2001: 36). The growth of archaeological survey in Japan was underpinned by postwar economic development and a national imperative for salvage excavations. Since the economic slowdown in the mid-1990s, many critical questions about Archaeological Heritage Management (AHM) and public archaeology have emerged. The subsequent long-term economic slump and expanding neoliberalism in politics have further complicated the situation, and as a result Japanese archaeology today seems to be at a stalemate.

Definition

There are no terms in Japanese equivalent to "commercial archaeology" or "contract archaeology" as used in the UK, the USA, and other countries. Perhaps many Japanese archaeologists, who are accustom to a "socialist" model in contract archaeology (Kristiansen 2009: 643) and a notion of heritage as the preservation and use of buried cultural properties, would frown upon those terms as well as heritage "industry," as ones associated with the marketing of archaeology found in countries where private land ownership is strong. However, "commercial archaeology," as it is meant in other countries, does actually exist in Japan and has become influential in Japanese archaeological heritage management. It is often examined within the administrative heritage sectors but is rarely discussed as an archaeological agenda.

Key Issues/Current Debates/Future Directions/Examples

In Japan, it is conventionally accepted that the cost of archaeological investigation prior to construction of private homes is borne by the state. However, when rescue excavation takes place as a result of construction work for commercial purposes, the cost is paid by the "polluter," namely, the developer, be it a public or private body. The principle of "polluter pays" was first adopted in 1958, when rescue excavation required in

advance of the construction of the Meishin Expressway was financed by the developer: the Japan Highway Public Corporation. The same principle was repeated in protocols the Agency for Cultural Affairs exchanged with other bodies in charge of public works, such as Japan Housing Corporation and Japan Railway Construction Public Corporation. Thereafter, the principle came to be applied, conventionally, to private development companies as well.

In 1965, there were only eight experienced field archaeologists employed by regional boards of education (Tsuboi 1992: 3). As archaeologists were increasingly employed and positioned at the local government level, an administrative system for managing buried cultural properties and conducting rescue excavations was gradually established, first at prefectural and then municipal levels, under the national government's supervision. Local authorities began setting up their own units to look after cultural properties and, in some cases, instituted "semipublic" (nonprofitable) self-governing foundations specializing in archaeological investigation. The number of specialists in charge of buried cultural properties employed in local governments or semipublic foundations rose to a maximum of 7,111 in 1997 (Seino 2009: 41). Today, even during a recession, approximately 8,000 rescue excavations are still carried out yearly across the country. These rescue excavations account for approximately 95% of all archaeological excavations conducted in Japan. All 47 of prefectural governments and over 65% of municipal governments (1,192 out of 1,834) employ archaeologists in charge of buried cultural properties. On the prefectural level, 1,120 archaeologists work for local governments and 1,122 for semipublic foundations. At the municipal level, 3,095 archaeologists work for local governments and 918 for semipublic foundations (Seino 2009: 41–44). These figures attest to the nationwide AHM operation today.

How has AHM been able to develop so rapidly in Japan? An important factor is the "polluter pays" principle that originated in the period when the Japanese economy was growing fast. Although the polluter pays principle has not been clearly stipulated in the Law for the Protection of Cultural Properties (Tanaka 1984: 84), it has guaranteed a source of financial support for AHM in Japan and has fundamentally helped its development. It is interesting to note that the notion of buried cultural properties as the "common property of the nation," as defined by the Law for the Protection of Cultural Properties, has been adopted by both the government and the developers in their cooperation in rescue excavations. For the government, it has been important to preserve archaeological materials – albeit mostly by record only – on the grounds that they are legally relevant to us, namely, all Japanese. The developers, on the other hand, have been funding rescue excavations not only for the promotion of a socially committed corporate image of themselves but also because of the need to understand and respect the past and our ancestors. Financially supported by the polluter pays principle and technically aided by state-of-the-art techniques of excavation, such as the use of conveyer belts and aerial survey, AHM in Japan has developed into a system of prompt and efficient excavations; it has produced a massive amount of archaeological data, including up to some thousand site reports a year.

The Impact of "Privatization"

The biggest challenge the current AHM system is faced with is the growth and expansion of private archaeological units. Private archaeological units have already been in operation for a few decades, particularly in the Kanto region (including Tokyo and Yokohama), but most of them were small in size and led by professional archaeologists. In contrast, newly emergent private units are established at the initiative of, and more significantly, "within," building or engineering companies and are now mainly large enterprises. These units gained momentum for expansion particularly under the Koizumi cabinet (2001–2006), which pursued privatization and budget cuts in various aspects of public works under slogans such as "From public, to private" and "What the private can do must be entrusted to the private." Private units waged lobbying campaigns for privatization of salvage excavations and, to further pursue this objective, established in 2005 their

own business association Nihon Bunkazaihogo Kyoukai, in which about 70 units participate.

This association started administering their own qualification examinations, particularly in archaeological technical field, which prompted serious discussions on the issues of quality assurance and standardization in contract archaeology. They have been successful in increasing the number of excavations they undertake and are today aiming to further expand their areas of activity, including active trials to increasingly involve themselves in rescue archaeological practices in the area affected by the Great Eastern Japan Earthquake of 2011. It should be noted that major construction companies such as Obayashi Corporation, Kajima Corporation, and Shimizu Corporation are "supporting members" of Nihon Bunkazaihogo Kyoukai. This means that for these construction companies – private developers – rescue excavations present a new attractive business market for profit, particularly to counteract the effect of the recent recession in the construction industry. Naturally, the developer tends to be far less interested in the quality of excavation than effective management. It is feared that the partnership between developers and private archaeological units might lead to the deterioration of the quality of excavation, publication of its results, and succession of archaeological heritage to local communities. As a result, the geographical gaps in AHM are likely to expand. Privatization of rescue excavations would only contribute to further widening of these gaps, as larger private archaeological units, usually based in big cities in economically powerful prefectures, would be able to undertake rescue excavation in other prefectures and regions. At worst, it is feared that archaeology might come to be dominated by a limited number of large private units, thus weakening the activity of smaller and more locally based archaeological units.

When contract archaeology prior to development for public works and private house is funded by public money (tax), ethical issues, such as who benefits from the excavation, are not so serious as long as research standards are maintained. However, when it comes to development by private companies for commercial purposes, the asymmetrical relationship between the fund payer (the individual) and reward/benefit (shared by the public, including the individual) will give rise to a sense of unfairness. This will cause ethical dilemmas for heritage managers too. The only way to discourage this change in situation is through speedy (i.e., inexpensive) excavations.

Commercial archaeology need not cause serious problems if heritage managers hold enough power to check and control the research of commercial units and are capable of appreciating and presenting their results. In practical, however, it is not easy to ensure such conditions. The quicker research is done, the more profitable commercial units are. They might avoid taking enough time to research complicated features and fragile finds in time critical (e.g., urban) sites or difficult (e.g., wetland) sites. It could be difficult to ensure that all units behave in good conscience. Particularly, it is probable that units originating from the building or engineering companies (unique and characteristic of Japanese commercial archaeology) to shake hands with developers under the table. In terms of benefits for local communities, compared to experienced and engaged local units which are familiar with the past of the area, large-scale private units with no particular regional background tend to be insufficient at interpreting and appreciating their finds. This lack of contextual information for finds would lead to a poor presentation of the past.

So far, I have deliberately focused on the negative aspects of commercial archaeology, but when we compare the results from experienced professional units with those of inexperienced heritage managers, the former will undoubtedly get more information from a site. It is also true that those units provide both jobs and good training to inexperienced young archaeologists. However, generally speaking, this matter of an increasing number of inexperienced heritage managers and/or the retirement of experienced archaeologists needs to be examined first in terms of the sustainable handing down of local heritage. In the long run, the commercialization of archaeology in Japan will increasingly go against the public interest. Quality excavation and the preparation of reports are crucial but are even more valuable

when available for use in presenting the past and education. Neoliberalism involves anything in a field of competition. But, the world of archaeological heritage often never fit to calculative and and/or dichotomized way of thinking. Commercialization in archaeology is a global issue. Archaeologists, across the country, should become involved in this discussion in order to explore the public benefit of archaeology and heritage management.

Cross-References

- ▶ Cultural Heritage and Communities
- ▶ Ethics in Archaeology

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Ethics of Commercial Archaeology: Nigeria

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Introduction

The discussion of ethics in archaeology has assumed a contentious dimension with different segments within the discipline waging intellectual war on who is ethically correct or wrong. It has been observed that though archaeology may be dealing with lifeless, static, materials of the past, it still requires adopting certain cultural standards to maintain suitable ethics that would include a number of important moral issues (Johnston 2012). The issue of ethics in archaeology is not new; what is new is the frequency and necessary passion of ethical discussions. In the past two decades, archaeology has changed so much that it seems like a new discipline. Many past archaeological works lacked sound ethical considerations such that they are today regarded as little more than tomb-robbing debacles. In the United States, it has been observed that "the most dramatic ethical vacillations are a result of the emergence of contract and conservation archaeology." These developments "have delivered archaeologists from their insular academic world to a broad spectrum of professional and political communities" (Joukowsky 1991).

Definition

The Webster's Dictionary defines ethics both as a system of moral values governing a profession and an individual's moral code. Archaeological ethics are prescribed guidelines in which archaeologists are to conduct each phase of their responsibilities. Archaeologists are bound by a code of conduct that includes observing intellectual property rights, scientific credibility, and territorial legal obligations.

Archaeologists are required to preserve and manage the archaeological record with all due diligence to include treating human remains with dignity and permitting the local authorities to manage their preservation in an appropriate manner. The principles of archaeological ethics adopted in 1996 by the Society for American Archaeology "outlined stewardship, accountability, commercialization as well as public reporting and preservation" (Stambaugh 2012).

Commercial archaeology may have two meanings, the first being the archaeology concerned with the material culture aspects of commerce and transportation. It refers to the study of structures and artifacts created in connection with popular commercial activity, such as diners, motels, gasoline stations, and signs, and also focuses on the effects of a market economy on cultures and the use of space (Hirst 2012). In the United States, the Society for Commercial Archaeology is a national organization devoted to the buildings, artifacts, structures, signs, and symbols of the twentieth-century commercial landscape. The second meaning of commercial archaeology is what concerns we have, and it is sometimes called contract archaeology, rescue archaeology, salvage archaeology, or preventive archaeology which is archaeological survey and excavation carried out in areas threatened by, or revealed by, construction or other land development. These could be the case in highway projects, major construction, and the floodplain of a proposed dam and the laying of oil pipelines. In essence, commercial archaeology is conservation archaeology, and it is included in the broader category of cultural resource management, and unlike traditional survey and excavation, it is undertaken at speed. In terms of the definition of research and selection of site, conservation is problematic as sites are not selected or excavated to answer particular research questions, but they are excavated because of their location in threatened areas. Conservation archaeology like all archaeology destroys sites, and in the situation where the highest research standards are lacking, the site is lost forever (Joukowsky 1991).

Key Issues/Current Debates/Future Directions/Examples

The practice of commercial archaeology, rescue archaeology or whatever terminology, is largely restricted to North America, South America, Western Europe, and East Asia, especially the United States, Canada, the United Kingdom, Korea, and Japan (Rescue archaeology-Wikipedia). The passage of environmental protection laws in the United States in the 1970s led to the growth of this kind of archaeology which could also be termed "business archaeology- in which archaeology is ordered by private consulting firms working for profit under contract to developers or governmental agencies who are required to conduct archaeological research in compliance with environmental protection laws" (Joukowsky 1991). In the United Kingdom, RESCUE: The British Archaeological Trust was formed in 1971 to address the problem of the destruction of archaeological resources occasioned by the widespread redevelopment of historic towns and cities which had started in the 1950s running through the 1960s. A priority for RESCUE was the need to get government subsidies to support archaeological rescue work ahead of large-scale development projects (Everill 2012). In the text of the European Archaeological Association's Principles of Conduct for archaeologists involved in contract archaeological work, an earlier phrase "commercial archaeological work" was replaced with "contract archaeological work" before it was approved in 1998. This reflects the view that archaeology is not a commercial activity though it is often carried out under various kinds of contracts (European Archaeological Association 1998).

Commercial archaeology as elucidated above does not exist in Nigeria, and it is paradoxical that the history of the practice of archaeology in Nigeria is traceable to salvage archaeological works. Archaeological finds of terracotta objects in the tin mines on the Jos Plateau in 1928 and of bronze objects in Benin, Ife, and Igbo Ukwu in 1938 through activities such as digging foundations for houses and public buildings marked the beginning of conscious efforts to document and

preserve archaeological resources in Nigeria. The Nigerian Department of Antiquities was established in 1943, and archaeologists were engaged to investigate sites where there had been accidental discovery of archaeological materials and also monitor where public works were being undertaken. When the Kainji Dam was conceived, the Department of Antiquities commissioned an archaeological survey of the area to be flooded, and preliminary survey work was done in 1962–1963 and was followed by limited uncoordinated salvage work in 1968 few months before the area was flooded. Since then, rescue archaeology had been in the cooler despite the high incidence of construction works that involved urban renewal, development of a new capital city, and facilities development (see Folorunso 2008).

It has been noted that "the emergence of contract and conservation archaeology have delivered archaeologists from their insular academic world to a broad spectrum of professional and political communities" and that the traditional academic values of archaeology "are brought to clash with the less supportive, more profit-oriented ethics of the business world" (Joukowsky 1991). The archaeologists had ceased to be a part of a small community with homogenous values and now work with heterogeneous value systems, faced with people and institutions with discordant agenda with that of the academy and deal with value systems inherent in business, government, and the nonacademic public. Archaeologists now deal with the business ethic as well as the traditional academic value system. They are responsible to the public, their profession, and their own clients (Joukowsky 1991).

In Nigeria, contract archaeology is not mandatory, and when a semblance of contract archaeology is envisaged, it is within the confines of Environmental Impact Assessment (EIA) required for projects financed by the World Bank as formulated in 1999 and revised in 2011.

> The World Bank requires environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sustainable, and thus to improve decision making. EA takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and physical cultural resources); and transboundary and global environmental aspects. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. The Bank favors preventive measures over mitigatory or compensatory measures, whenever feasible. (World Bank 2012)

The policy further elaborates on what concerns archaeology under physical cultural resources which became operational in 2006 and updated in 2007:

> This policy addresses physical cultural resources, which are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. The Bank assists countries to avoid or mitigate adverse impacts on physical cultural resources from development projects that it finances. (World Bank 2012)

One important issue that seems to occupy discussions on contract archaeology has centered on the question of who controls the process of archaeological investigations. Agencies and developers typically would want to spend minimally when it comes to archaeology, and this usually has great consequence on the quantum and quality of the archaeological work that is done. It has been noted that a "client can be unwilling to protect sites from collectors or can threaten to sue the archaeologists if excavation inhibits heavy machinery." The clients may also fail to promptly notify archaeologists of subsurface destruction for the archaeologist to react, such that the archaeologists sometimes cannot even fulfill their own contracts. They are then left to decide if the responsibility is to the client, the actual resource, the public, or the regulatory

agency that ordered the work in the first place (Joukowsky 1991). In the end, even the most ethical archaeologist cannot contend against the power of the state governments, and archaeological morality often would suffer at the hand of economic development or national ideologies. An obvious example was the London rail link for the Channel Tunnel, where important human remains at St Pancras Cemetery were hastily dug up and mistreated in order to maintain the schedule of the infrastructure project (Johnston 2012).

For a long time, the process of the implementation of the EIA requirements in Nigeria had been under the control of developers as they commission consultants from the universities who are mainly biological and physical scientists to conduct impact assessment studies. The archaeological aspects of the studies are usually ignored, and where they are included, the individual archaeologists selected by the main consultants are made to write reports just to make the assignment of the consultants to look somehow complete. No single serious archaeological survey or rescue/salvage work is known to have been done through the numerous EIA studies that had been executed in the country. The process can therefore be judged to lack transparency and fraught with corruption. However, a recent development arising from a probable query of a suspicious EIA archaeological report that had ignored the significance of archaeological features located on plots of land earmarked for the siting of a power plant in Benin provided some rays of hope for commercial archaeology in Nigeria. An international consultancy firm for EIA with experience and expertise in archaeological impact assessment, specifically Environmental Resources Management (ERM) of the United Kingdom and United States, was brought in to reassess the plots of land in 2014. ERM handled its assignment professionally, sought, and got the collaboration of the author of this chapter to execute the reassessment of the plots of land in Benin.

The experience gained doing commercial archaeology work in Benin has provided insight into the disposition of developers and the locals (traditional rulers, landowners, and opinion leaders) to archaeological assessment of lands earmarked for development. As usual in land matters in Nigeria, there was legal dispute over the ownership of the plots of land in question between two neighboring communities. The community which finally gained control over the land claimed that there was no moat on the land that would require archaeological investigation. A community opinion leader, specifically the principal of the community secondary school, stated that the features the archaeologists were referring to as moats were constructed to check erosion in the early 1960s when he was a young boy. Simply put, the community did not want any archaeological survey that would suggest that moats existed on the plots of land because in Benin traditions, moats in the past marked boundaries. For them the suggestion of the existence of moats would be against their interest. Expectedly, the representative of the developers on his part allied with the position of the community and considered archaeological investigations unnecessary apparently because of the cost that would be involved and the delay that would intervene in the processes of perfecting agreements with the funding bodies. This was more so because there was another completed power plant on adjacent plots of land which apparently might not have undergone the rigors of archaeological investigations before its construction. At the end, the argument that prevailed was to allow archaeology to establish if the features were recent or ancient moats particularly since Benin was well known for ancient landmarks on its landscape.

The Benin episode definitely marked the beginning of the practice of commercial archaeology in Nigeria. A team of archaeologists consisting of two parts was constituted: one part consisted of an archaeologist from ERM (UK) and two archaeologists from Wessex Archaeology (UK), and the second part consisted of six Nigerian archaeologists from the University of Ibadan (Fig. 1). The necessary permission was obtained from the National Commission for Museums and Monuments (NCMM), and an archaeologist from the Commission at the National Museum in Benin represented the NCMM on the team of archaeologists. Considering the stage the power plant project had reached, all engineering proposals had

Ethics of Commercial Archaeology: Nigeria, Fig. 1 Team of archaeologists on commercial archaeology at Benin

Ethics of Commercial Archaeology: Nigeria, Fig. 2 Setting up Total Station for mapping in Benin

been perfected, compensations were being paid to the landowners, and final approval was being expected from the funding bodies, we decided to undertake conservation work by recording. The site was surveyed using total station to map features (Figs. 2 and 3), while portions of the moats and ditches were mechanically excavated (Fig. 4) and a small test pit was manually dug at a spot within the plot. Materials (potsherds, pollen, and charcoal) had been analyzed and the whole work fully reported to the client (developer).The archaeological investigations showed that the plot of land was an ancient landscape consisting of two moats and associated ditches. The recommendation was that the client should ensure the presence of archaeologists on the site when the bush clearing was to be done.

The bush clearing was in two phases; the first phase was the preparation of a portion of the land in the second half of 2014 for the official

Ethics of Commercial Archaeology: Nigeria, Fig. 3 Mapping of archaeological features at Benin

groundbreaking ceremony. An archaeologist was invited to the site after the clearing had already started. The cleared areas were examined, and materials, mainly potsherds, were collected for the study. The second phase was more than mere bush clearing as actual construction works started along with bush clearing in January 2016. The client again set the terms and specified 6 days for the duration the archaeologists would be required on the field. The construction firm however could not say when it would complete the bush clearing. The representative of the client was obviously always thinking of cutting the cost on anything archaeology; in the end two archaeologists were kept on the site for 3 weeks basically following the machines as they cleared the bush to collect surface materials and record features with GPS receivers and camera. One could probably state that the practice of commercial archaeology which hitherto was not known in Nigeria in its strict sense was done in 2014 and 2016 though in an environment that could not be described as free will. We might have therefore seen the beginning of commercial archaeology in Nigeria and hope that it would not end with the episode in Benin.

Contract archaeology and contract archaeologists have come under strong criticism on the issues of ethics. For example, in Ireland, headlines such as "Archaeology needs to recover its core principles and ethics" have appeared in some print media as archaeology has been described to be currently in the throes of growing commercialization, and it is being ill served by corrupt semi-state/technocrat archaeologists, conspiring with under-scrutinized consultants to undermine and cajole staff into underplaying the significance or importance of the archaeological resource encountered on national road schemes and other developments to ensure that the proposed developments proceed as required by the government (Moore Group 2008). Critics have also defined contract archaeology differently, as the way the discipline of archaeology engages capitalist expansion, sacrificing its critical stance. Archaeologists are said to be mass-produced by laying emphasis on technical training within shorter periods to meet the contractual needs arising from the aggressive capitalist expansions in transport infrastructure and mining. Contract archaeologists are accused of abandoning any possible intervention in contemporary issues in order to dance to the rhythm of money and have turned the past into a commodity.

The aforementioned ethical issue to my mind would be applicable to places where there are strong national legislations, regulations, and institutions for the protection of cultural resources. In other places like Nigeria where such national legislations, regulations, and institutions are very weak or nonexistent, the issue of ethics becomes very different. For example, in Nigeria, despite the fact that the cultural legislations are weak, the institutions to regulate on archaeological matters also fail to fulfill their mandate because such institutions are not well constituted for the assignments. Archaeological impact studies as explained above are therefore done on the benevolence of the developer as a requirement by the project financiers and not by any national regulation. Since there are no enforceable regulations,

Ethics of Commercial Archaeology: Nigeria, Fig. 4 Mechanical trench excavation of a moat at Benin

the question of ethics becomes more of moral rather than legal issue. Underplaying the significance or importance of the archaeological resources to be impacted by the development project which was the case in Benin before a reassessment was undertaken was more of a moral issue since no regulation was breached. Recommending conservation by recording was the best deal archaeology could get in a very hostile environment where the developer calls the shot and considers the cost of archaeological investigations as unnecessary.

Another ethical issue with contract archaeology which is also applicable to Nigeria has to do with the dissemination of findings. It is known that within the accepted archaeological ethic, it is considered wrong to excavate and not disseminate information through publication. This is denying the public the right to know as many business organizations who order the excavations consider the resulting work their own property, and thus, archaeologists are barred from publishing the results (Joukowsky 1991). This negates the stewardship principle which is current in archaeology today and which sees archaeologists as caretakers of and advocates of the recording of archaeological data and that archaeologists must use the knowledge they gain from sites in order to promote public understanding and support. Frustration had been expressed with contract archaeology as to how the archaeological community as a whole has no means of knowing of or accessing a contractor's work results. It seems to be part of the contract that there should be no publication and no report. It has been noted that the inability for the contractor's archaeological work to see the light of day seems to be in direct disagreement with the principle of stewardship. It has therefore become pertinent to ask the questions of how beneficial are the projects, "if archaeologists are restricted by their reporting methods and if their actual reports are not released to the public or the archaeological community in some researchable system" (Stambaugh 2012).

The criticism of contract archaeology should not imply jettisoning it but how to make it more transparent and more ethical. Some critics may however imply that the ethical considerations of archaeology are not compatible with commercial ethics; they have not proffered solutions or alternatives than to do away with the capitalist's incursion. There is more destruction of archaeological resources and more unethical practices in heritage issues in countries like Nigeria where contract archaeology is not being practiced than in the countries where it is practiced. At least the

infractions on ethics have been raised, discussed, and debated as in the case of the M3 highway in Ireland. The reports of contract archaeologists, where they have been accessed by academics, have contributed to the production of archaeological knowledge. Therefore, the debate should go on to make contract archaeology more transparent and ethical as the alternative may be non-engagement which takes archaeology back to the era of helplessness in the face of wanton destruction in the process of land modification.

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Ethics of Commercial Archaeology: Southern Africa

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Introduction

As far as the discipline of archaeology is concerned, few areas evoke mixed responses as much as the issue of ethics in the subfield of commercial archaeology. To some in southern Africa, as in other places around the globe, commercial archaeology is an opportunity for archaeology to contribute to job creation, policy interventions, and sustainable heritage stewardship (Hall 1989), while to others, it sides with developers in destroying other people's irreplaceable heritage. Not surprisingly, the rise of commercial archaeology has raised a number of ethical dilemmas – the Hamlet's to be or not to be moments. Pro-commercial archaeology moral arguments stress the fact that commercial archaeology represents the last opportunity to save archaeological heritage in record before it is destroyed (Deacon 1992; Goudswaard et al. 2012). If archaeologists do not do it, then the heritage will be lost. This is a very appealing moral argument. However, often the very poor-quality commercial archaeology reports which are supposed to achieve preservation by record spectacularly fail to accomplish this goal. Furthermore, commercial archaeology is difficult to police and regulate in terms of quality. Heritage agencies in southern Africa such as the National Museums and Monuments of Zimbabwe and the

South African Heritage Resources Agency lack the capacity and resources to verify the truth of the recommendations of archaeologists on the ground. This means that a lot is now depending on the ethical position of archaeologists involved.

To make matters worse, commercial archaeologists, particularly in southern Africa, are increasingly arguing that they are in business and have to earn a living while being competitive. Fair enough, the only problem is that recently, there has been a rise in the use of proprietary tools, resulting in the copyrighting of commercial archaeology reports. This has placed restrictions on use. Therefore, commercial archaeology in southern Africa is now more of a compliance requirement than a real method of salvaging an accessible past. Furthermore, in southern Africa, local communities have always played a peripheral role in the discipline of archaeology (Chirikure et al. 2010). Often, commercial archaeology does not give anything back to the community through corporate social responsibility programs. This creates one of the most important unforeseen moral dilemmas of commercial archaeology – it exploits other people's heritage and yet fails to plow back into communities like what other businesses do. Commercial archaeologists therefore cannot have their pie and enjoy it alone. The only impediment, however, maybe that often, the fees charged are not high enough to allow generous investments in communities like what big mining corporations such as Rio Tinto and BHP Billiton can manage. This requires a rethinking of the philosophical basis of what commercial archaeology is and what it must do. Otherwise, it risks becoming one of those unwanted evils that neither preserves the past nor benefits communities but only feeds the pockets of a few.

Background to Southern African Commercial Archaeology

Southern African archaeology is now just over a century old. As in most former colonized regions, the discipline has a western ancestry (Chirikure and Pwiti 2008). It was transplanted to the region in the late nineteenth century by early travelers, missionaries, geologists, and other peripatetic scholars who were enchanted with the past of the newly colonized territories. The colonial legacy of the discipline of archaeology in southern Africa dictated that archaeology emerged as a western affair without much involvement of the locals. Colonial legislation such as the archaic Rhodesian (Zimbabwe) 1902 and the South African Bushmen Relics Ordinance of 1912 had no regard for local communities just as their successors, respectively, the National Museums and Monuments Act of 1972 and the National Monuments Act of 1969 (Pwiti 1996).

The roots of commercial archaeology in southern Africa can be traced infamously to the notorious Ancient Ruins Company formed by Cecil John Rhodes to explore for gold in the ruined monuments of Rhodesia (Hall 1990). Richard N. Hall was employed as the "excavator" of Great Zimbabwe where he looted an unknown number of gold and other objects. The atrocious methods of Hall and his denial of an African authorship for Great Zimbabwe raised ethical considerations and led the British Association for the Advancement of Science to dispatch a professional archaeologist Randall MacIver (1906), who was a professionally trained archaeologist, to excavate at Great Zimbabwe. MacIver concluded that Great Zimbabwe was local in origin but he could not sway established settler opinion. Throughout the colonial period in southern Africa, archaeology neither had a place for local communities nor how the same communities felt about the desecration of their heritage (Chirikure et al. 2010).

Not surprisingly, by the time commercial archaeology emerged in the late 1980s and early 1990s, it emerged of a background of alienation of local communities (Sheperd 2006). As such, it inherited the ethical dilemmas of the discipline of archaeology which had no place for local communities. The legislation empowered archaeologists to desecrate sacred places against local people's wishes under the name of science. Commercial archaeology in southern Africa started sporadically from the 1960s. The proposed construction of the Kariba Dam in the 1950s

prompted an impact assessment of the area to be flooded, and after that a number of dam projects witnessed archaeological impact assessments. In South Africa, commercial archaeology *sensu stricto* began in 1989 with the establishment of the National Environmental Act which called for pre-development impact assessments to be carried out (Deacon 1992). In 1999 when South Africa had obtained independence, the new National Heritage Resources Act borrowed from international best practice and local needs. It made archaeological impact assessments mandatory resulting in an upsurge of contract archaeology. Nowadays, there are many archaeologists employed as contract archaeologists, a development which is very positive for the discipline. Although legislation in other southern African countries varies in terms of degrees of effectiveness, commercial archaeology is now strong in Botswana, Mozambique, Namibia, Zimbabwe, and other places. This has been precipitated by the fact that IMF- and World Bank-funded projects require environmental and heritage impact assessments to be carried out. There is no doubt that commercial archaeology represents a step in the right direction for archaeology. It has opened up job opportunities beyond the traditional university and museum openings. However, because the field is relatively new, it is often confronted by a number of ethical challenges such as quality control, significance assessment, and even the recommendations by archaeologists themselves (Scarre and Scarre 2006). All these challenges put spotlight on the question of ethics and make commercial archaeology a necessary but uncontrolled evil in the eyes of some people.

Definition

From a generalist point of view, ethics are partly an individual belief system that consists of making distinctions between the right and the wrong (Kintigh 1996; Wylie 1996) and partly an ability to analyze decisions, beliefs, and actions. Ethics are concerned with the critical appraisal of human conduct and character (In 1992; Scarre and Scarre 2006). Therefore, ethical issues vary from discipline to discipline and context to context. In commercial archaeology, ethics refer to morality issues that are raised by the business of salvaging the past in the face of development (Dunnell 1984; Hall 1989). Within the commercial context, businesses are expected to have good ethical values and to act in a socially responsible way. Commercial archaeology thrives on making profit out of "priceless" objects and commodifies a resource known as the past. This presents a moral dilemma because an individual's pursuit of fortune through exploiting the past must be done in a way that is responsible to the archaeological record and its multiple stakeholders. Therefore, commercial archaeologists run businesses but retrieve invaluable data to preserve the past by record. They also make decisions on the future of heritage recommending no go for development in the case of sites with high significance and recommending mitigation in cases where significance is low. This requires good ethics from individuals concerned. Where they exist as in the case of the Unites States, professional associations require that their members adhere to good ethics (Kintigh 1996). The Association of Southern African Professional Archaeologists has a code of ethics and conduct for commercial archaeologists. However, there are no sanctions for those who breach ethics. Also, because the body is not a legal entity, membership of ASAPA is not necessary for one to practice commercial archaeology. Furthermore, ASAPA is strong in South Africa and weak in other southern African countries. A lot of bad practices are carried out without impunity. Commercial archaeologists must embrace the duty of care principle which obliges them to treat the archaeological record and the host communities with respect. Yes, they are in the business to make money but they must not do so at the expense of the archaeological record.

Key Issues/Current Debates/Future Directions/Examples

Commercial archaeology occupies an important interstitial space between studying the past through material remains and the need for people

to earn a living. In fact, most other disciplines such as psychology and economics, among others, now also have commercial arms (Wylie 1996). However, strong ethics are needed to steer commercial archaeology into the future. Bad ethics will alienate stakeholders and are thus unwelcome. There are a number of key areas where strong ethics are needed in southern African archaeology. The first and perhaps most important one is that archaeologists have a primary responsibility for the past on behalf of society. As such, their actions must be guided by the need to preserve and communicate the past. All businesses need to make profit but they must not lose sight of core values. By affirming their allegiance to the archaeological record for present and future generations, commercial archaeologists must make professional and informed recommendations that result in the protection of significant heritage while allowing development to proceed. There are archaeologists who are known for not finding any significant sites. Commercial archaeology must improve standards of fieldwork and data collection to ensure that it creates a usable archive for others. Current attempts to copyright information from reports while making business sense ultimately mean that new protocols must be developed to access information for studying the past. Heritage Western Cape, the provincial arm of the South African Heritage Resources Agency, has in the last few years encountered situations where the issue of copyright was debated. The heritage authority recognized the rights of authors of reports but also determined that it must be able to use part of the reports to fulfill its legislative mandate. One way to solve this copyright issue is for archaeologists to publish their reports to make them publicly accessible. There are some commercial archaeologists who believe that commercial archaeology is all about data gathering. However, it is not clear what the data will be used for since often the quality is not good some of the time. This means that the data from commercial archaeology is not usable defeating the whole purpose of conserving by record. In countries such as Australia and the Netherlands, commercial archaeologists publish works based on their experience which also helps in the evolution of the discipline. This is not yet the case in southern Africa where the belief that commercial archaeology is either a business or all about data gathering is strong. Intellectual property issues relating to data ownership are not yet resolved. It is the archaeologist who would have produced the report, but having been paid by the developer to fulfill a legal requirement, the issue gets convoluted if the archaeologist also subcontracts another archaeologist. Therefore, there is an urgent requirement to consider these ethical issues to create a more usable commercial archaeology outcome.

The other ethical issue of strong relevance is the need to regulate commercial archaeologists. Most of them operate independent small companies that are registered with the registrar of companies. However, it is difficult to enforce standards and accountability because administrative organizations are short staffed. While the South African Heritage Resources Agency has always complained about poor-quality reports, nobody has been sanctioned for poor work. Equally, the Association of Professional Archaeologists has no penalties for members who produce substandard reports. Thus, a code of practice without consequences becomes gatekeeping another morally undesirable thing (Hall 2005). Thus, while commercial archaeologists are making money out of studying the past, their responsibility to the archaeological record is often suspected. Strong ethics are needed to ensure that it is not just the archaeologists who benefit but also the past.

The other issue requiring ethical consideration is the issue of how local communities are often sidelined in commercial archaeology. Very few legal instruments in southern Africa have a provision for community consultation in archaeology. As such, archaeologists make decisions about insignificance and significance of other people's heritage based on their expert training. If ethics are adhered to, there is no problem. However, there are cases in which ancestral graves have been forcibly relocated against the wishes of local communities. Even in South Africa where the legislation calls for community participation, the consultation is often left till the end of the

projects when all the major decisions would have been made. Perhaps, this ethical dilemma would be less of a problem if commercial archaeologists invest in the local communities through corporate social responsibility programs. However, the funds are often very small and do not allow generous investments by archaeologists into the communities. One way of solving this problem would be for the archaeologists to make their clients uplift communities. For example, the South African Department of Environmental is insisting that companies operating around the Mapungubwe World Heritage site must devise public beneficiation programs. The archaeologists who carry out the impact assessments are supposed to come up with suggestions. While it is still early days, it is hoped such an intervention may result in more communities benefitting from their heritage.

Finally, commercial archaeology seems to be enjoying the best from two worlds. In the first instance it is still archaeology which is about a people's legacy and all the responsibilities that come with that. In the second one, it is a business and yet does not adhere to ethics in the business world. The corporate environment has strong and established ethics. For example, the Institute of Directors of South Africa came up with the King's Code II for corporate governance and social responsibility. It would be good for commercial archaeologists to implement accountability standards enshrined in this document. This will ensure that they are fully commercial and regulated by the stronger ethics that govern the business world.

In summary, the opportunities associated with commercial archaeology are massive. Commercial archaeology occupies an important interstitial space between archaeology and what society needs. However, strong ethics must be adhered to for society fully benefit. There is need for systems of quality control and accountability to ensure that the profit motive does not disadvantage the past. Also, commercial archaeology must be regulated to ensure that data quality is high. Intellectual property issues must also be resolved to ensure access to information for all. Commercial archaeologists have a duty to communicate the results of their work beyond the mandatory reports. It is simply not enough to state that commercial archaeology is all about data gathering when the data is not usable and the quality of reports leaves a lot to be desired. Furthermore, multiple voices must be heard in the decision-making processes associated with commercial archaeology (Hodder 2002). Lastly, archaeologists in southern Africa must take the issue seriously if they are to make good contribution to society and to shake off the colonial baggage of the discipline.

Cross-References

- ▶ Ethics and Human Remains
- ▶ Ethics in Archaeology
- ▶ Ethics of Collecting Cultural Heritage
- ▶ Ethics of Commercial Archaeology: Australia
- ▶ Ethics of Commercial Archaeology: Brazil
- ▶ Ethics of Commercial Archaeology: Japan
- ▶ Ethics of Commercial Archaeology: Nigeria
- ▶ Ethics of Commercial Archaeology: USA
- ▶ Ethnic Identity and Archaeology
- ▶ Stakeholders and Community Participation
- ▶ Vandalism and Looting (Ethics)

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Ethics of Commercial Archaeology: USA

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Introduction

Once upon a time, most archaeologists were employed by academic institutions and museums. Today in the United States and other countries, most archaeologists – and many historians, architectural historians, historical architects, and a few cultural anthropologists and geographers – are employed by profit-making commercial companies engaged in work on behalf of government agencies and private development interests. Working in this context can present ethical challenges for which many archaeologists (among others) are ill prepared.

Definition

As used here, "commercial archaeology" means archaeology conducted by profit-making commercial entities such as consulting firms. Some such firms are purely archaeological in character; others work more broadly with "heritage" or "cultural resources," variously defined. Others are more generalized still, engaging in broad-scoped environmental impact assessment (EIA). Many are architect/engineer firms organized to support the design, construction, and operation of dams and reservoirs, pipelines, energy production schemes, irrigation and agriculture programs, mineral extraction, logging, protected area management, housing schemes, urban development, military base management, and other rearrangements of the earth's surface to accommodate perceived modern human needs. A few specialize in the recovery of commercially valuable objects from shipwrecks and similar contexts.

"Ethics" as used here refers to the moral principles governing or guiding an individual or group – in this case archaeologists who practice in commercial contexts.

Key Issues/Current Debates

Although there have been commercial aspects to archaeology since the field's inception (see, e.g., the wheeling and dealing in early Egyptology documented by Noel Hume (2011)), the development of a self-consciously commercial archaeology sector began in the 1970s, at least in the United States. This sector arose in response to the enactment of laws requiring EIA (notably the National Environmental Policy Act of 1969) and providing for special attention to be paid to historic places including archaeological sites (notably Section 106 of the National Historic Preservation Act of 1966). Agencies of the US government, and by extension those seeking financial assistance or permits from such agencies, now (in theory) had to ascertain

what impacts their planned actions might have on archaeological sites, among other aspects of the environment, and they often had to do things – like excavation of such sites – to avoid, reduce, or otherwise mitigate project impacts. These requirements created a market for archaeological survey and excavation that quickly became too big for the universities and museums to satisfy. Moreover, agency planning schedules could not easily accommodate the leisurely pace of academic-/museum-based archaeological research and often required that attention be paid to places and research problems in which academic- and museum-based archaeologists had little interest. As a result, the traditional archaeological institutions tended (and tend) to disdain commercial work. The commercial archaeology sector arose to fill the gap.

In 1979, a debate between James Fitting and Albert Goodyear in the *Journal of Field Archaeology* highlighted the central ethical issue that confronts commercial archaeologists: Whose interests are they to serve? Fitting, an early lion in the field, argued that the commercial archaeologist's primary obligations are to his or her client. Commercial archaeology, he said, must be "client oriented" and is incompatible with the academic model of archaeology as knowledge production. Goodyear, based in an academic research institute, warned that client-oriented archaeology tempts archaeologists to "write off" sites that lie in the way of a client's project, as "a profit- maximizing strategy that minimizes the costs of field work, analysis, and writing, and.. can engender a good business relationship with clients" (Fitting and Goodyear 1979: 355).

It should be noted that neither Fitting nor Goodyear expressed interest or concern for the value an archaeological site (or other piece of "heritage") may have for purposes other than archaeological research. This was characteristic of the times.

As commercial archaeology has developed, Fitting's model has been implicitly accepted by virtually everyone. Like it or not, commercial archaeology is not directed toward learning about the past for its own sake, for the sake of scientific and humanistic research, for sustaining a community's heritage, or even for the sake of enlightening and entertaining the public. Rather, it is directed toward compliance with laws and regulations that government agencies enforce with widely varying degrees of rigor and intelligence and that clients typically regard as costly nuisances. Archaeologists and their historical, architectural, anthropological, and geographic colleagues must perforce orient their work with reference to – though not necessarily in sympathy with – their clients' interests and needs.

This results in a range of common ethical dilemmas. For instance, what is the ethical course of action for an archaeologist in each of the following cases?

1. The client's project will destroy a number of archaeological sites. The archaeologist is charged with evaluating them. If she evaluates them as significant, it will be costly for the client, who will be expected by government regulators to protect them or subject them to expensive, time-consuming excavation. The client may well fire the archaeologist and hire another who will say the sites are not significant. How should she evaluate the sites?
2. The client needs for surveys of potentially threatened sites to be done quickly, in order to meet project planning and financing schedules. The client also wants the work to be done as inexpensively as possible. The archaeologist thinks that the nature of the area and its sites demand more time-consuming and costly studies. The archaeologist stands to gain financially from conducting such studies. What should he propose and how?
3. The client's project will destroy places – maybe archaeological sites but perhaps simply natural landscapes (such as mountains or rivers) or landscape features like rock outcroppings or groves of trees – to which a local community may ascribe cultural or spiritual significance. The community is not skilled in interpreting the environmental and historic preservation laws. The client feels no obligation to attend to the community's interests and expects the r archaeologist to concern herself only with places that she, the archaeologist, thinks have research value. What should the archaeologist do?
4. The client's project will destroy places – maybe archaeological sites, maybe indigenous

spiritual places, and maybe historic buildings, landscapes, or whole communities – in whose evaluation and management the archaeologist has no expertise. The client expects the archaeologist, as their cultural heritage expert, to help them solve whatever problems these places present for the project, despite the archaeologist's lack of qualifications to do so. How should the archaeologist respond?

5. The client's project will destroy archaeological sites that could be preserved in place for perpetuity, but excavating them will simplify the client's development. The client is willing to pay well for the excavation, which itself will destroy the sites. Should the archaeologist agree to excavate the sites or argue for their preservation?
6. The client funds an expensive excavation that produces a large collection of objects and records. No nearby institution is equipped to care for this collection in perpetuity. The client plans to sell the collection after analysis and reportage is complete. Assume that no law forbids this. How should the archaeologist respond to the client's plan?
7. Or the client negotiates an arrangement with the putative descendants of a 4000-year-old site's residents to rebury everything excavated, without analysis and reportage. Again, assume that no law forbids this. Should the archaeologist, who will be paid well to do so, excavate the site?

These are only a few simplified examples of the ethical conundrums that commercial archaeologists routinely face; there are many others and many permutations on each. There are often no obviously right or wrong answers.

Many such conundrums result simply from the economic relationship between the client and the commercial archaeologist. As long as clients hire, and hence can fire, commercial archaeologists, it will be difficult if not impossible for archaeologists to adhere to ethical standards that do not very powerfully take the client's priorities into account. Some (like Fitting) argue that the commercial archaeologist is ethically obligated to accept and seek to advance the client's interests, as a member of the client's team. Others (like Goodyear) propose that the commercial archaeologist's core ethical obligation is to archaeological resources themselves – to sites, to their contents, and to the information they contain. Still others hold that one's primary obligation is to descendant or putatively descendant communities, where they exist, or more generally to the public interest, which may have many facets and internal contradictions. Ethical codes promulgated by archaeological organizations (cf. Register of Professional Archaeologists n.d.) provide only generalized guidance and affect only archaeologists willing to accept them; they have no effect on clients. In the end, they who pay the piper call the tune, and in commercial archaeology, it is the client who pays the piper. Some question whether this is a good model for archaeological – or more broadly for cultural or environmental – resource management (cf. King 2009), but as of 2017, it is the model with which commercial archaeologists work.

Cross-References

- ▶ Cultural Heritage and Communities
- ▶ Cultural Heritage in Times of Economic Crisis
- ▶ Cultural Heritage Management and Maritime Law
- ▶ Cultural Heritage Management and Native Americans
- ▶ Cultural Heritage Management and Submerged Sites
- ▶ Cultural Heritage Management Quality Control and Assurance
- ▶ Cultural Heritage Management Technology and Training
- ▶ Cultural Heritage Management: Business Aspects
- ▶ Cultural Heritage Management: Cost and Benefit of Change
- ▶ Cultural Heritage Management: International Practice and Regional Applications
- ▶ Cultural Heritage Protection: The Legal Sphere
- ▶ Ethics in Archaeology
- ▶ Ethics of Commercial Archaeology: Australia
- ▶ Ethics of Commercial Archaeology: Brazil
- ▶ Ethics of Commercial Archaeology: Nigeria
- ▶ United States: Cultural Heritage Management
- ▶ US Domestic Archaeological Heritage Law
- ▶ Stakeholders and Community Participation

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Ethics of the Archaeological Record

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Introduction

Why Digging Could Be Seen as a Problem in Archaeology

"Archaeologists dig; whatever the variation in methodology, at least archaeology involves digging." Ian Hodder already objected to this notion because of the complexity of the digging process (Hodder 1999: 18). That process is indeed complex on its own, and within the present day situation of it being subdued to the context of heritage management, we pose the question: Why dig at all? What is the goal of archaeology, and are we reaching it by digging?

Some scholars have already stated that digging is not necessarily synonymous with archaeology (Lucas 2001: 2). However, the daily reality is different as it is also reflected in how staff and students view the role of fieldwork in their academic curricula (Croucher et al. 2008). Archaeologists are intervening more, being more present during fieldwork, preserving more in situ, and digging "better" (according to the current logic of professionalization and of standardization of procedures), and this has become a generally accepted guarantee for the quality of archaeologists' work. As such, digging has been presented as a positive development for archaeology, cultural heritage management (CRM), and for the protection and understanding of the past in general.

In many cases, this assertion was and is true, and some archaeological sites were and are excavated, preserved, and studied in a really efficient and productive way (Demoule 2004; Bradley 2006). Over the past four decades, national and international regulations (including charts, codes, and treaties such as the Malta Convention in Europe (European Convention on the Protection of the Archaeological Heritage 1992)) have encouraged archaeological activities. This has included two different functions:

1. Preserving heritage in situ, when this did not compromise development
2. Digging and removing the remains of the past to save them before destruction

As Pearson or Shanks highlighted, "[from the 1970s] after a flush of enthusiasm for digging, I was left profoundly disappointed by a discipline that seemed simply obsessed with a set of techniques (and not particularly good ones) for supposedly recovering the past" (Pearson and Shanks 2001: 6). Thus, what could be seen now as obvious practices for archaeology – digging or preserving – still requires further scrutiny and challenge.

Archaeologists do not necessarily support these current practices, but they do defend them,

or participate in their application because this is the only activity understood and recognized by authorities, developers, and often the public (Lipe 1996: 26; Zorzin 2010: 189). This activity also guarantees the very existence of archaeology and defends archaeologists' career opportunities and salaries (Shanks and McGuire 1996: 79). Moreover, it was and is what archaeologists identify themselves with. Digging up artifacts was the core business of the first archaeologist, and it still forms a major attraction for (potential) students (Croucher et al. 2008: 29–30).

In our opinion, these developments need to be regarded as problematic. Because of the absence of an interpretative stage and a dissemination phase in the archaeological process (Lipe 1996: 24; Cumberpatchm and Blinkhorn 2001: 39; Bradley 2006: 8; Willems 2009: 91), accumulation of artifacts and of data is what is now the present day reality expected from archaeologists. It should also be noted that archaeologists too have contributed to this expectation and therefore should take their own responsibility in this matter. Within this logic, archaeologists are technicians of the past. The reality is, however, that archaeological activities are mostly based on an accumulation process that primarily serves the interests of a client by removing the problematic remains/structures as quickly and as cheaply as possible (Everill 2009: 2; Demoule 2010: 13–14). As such, we want to argue that nobody is benefitting from the accumulation of data and artifacts.

Furthermore, the world has been experiencing an economic crisis since 2007–2008 and it is likely that this will affect all sectors of archaeological practice (Schlanger and Aitchison 2010: 10), another reason for challenging current practices.

Archaeology matters, as Sabloff (2008) pointed out, and we do not wish to debate the importance of archaeology within present day society. On the contrary, we would like to state that by marginalizing the role of archaeological digging, we can actually focus on the production of knowledge rather than data and *improve* our contribution to society.

It is our belief that reflexive thinking should generate new questions about the nature of archaeological practice, its products, and its public, and these questions deserve to be formulated within the frame of ethics, because no ethical decisions can be made about archaeology without a critical approach to its aims and practices. We think an ethical archaeological practice should not be framed and limited by codes and regulations but on the contrary, permanently evolve and adapt to every situation and location where archaeologists are active.

Now, the question is, is digging in itself an ethical action? Does it answer the aims we have set ourselves?

Definition

Commercial Archaeology: Commercial archaeology, referred to as "developer-funded" archaeology, mostly developed in the western world, since the end of the 1970s, and defined as a service to a client. Most commercial archaeological activity relates to a specific area threatened by or uncovered by construction or development, and as such often equates with salvage archaeology. Commercial archaeology operates as a preservation device by record.

Archaeological Heritage Management: Policies of systematic protection of the past (Lowenthal 1998) have been transposed into the world we are living in – that is, in a capitalist organizational structure – through various legal tools and management concepts, from one of which is particularly active and gaining in popularity: Cultural Resource Management or Archaeological Heritage Management (CRM & AHM). In archaeology, CRM or AHM could be defined as a process consisting of the protection and the management of a large range of cultural heritage material, aiming to give the past some importance in the present and particularly in the present where urban growth and fast development are putting more and more pressure on material heritage.

Neoliberalism: This theory of political economic practices proposes that "human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong

private property rights, free markets, and free trade" (Harvey 2005: 2).

Since the 1970s, during a long period of elaboration of laws and regulations concerning archaeology, a process proper to neoliberal ideology affected the way archaeology was conceived and organized (Zorzin 2011).

Public Archaeology: A term that has been extensively debated over the last decade because of its wide-ranging consequences for the archaeological practice and its multidisciplinary approach. We argue that it is much more than a tool to achieve the goal of bringing the past to the public; it is also about democratizing the past through research and social action.

Historical Background

The nature of archaeological practice has been very much centered around the focus on digging up material remains; a large factor in the development of archaeology as a science (Lucas 2001: Introduction; Dyson 2006). As shown in many studies, within the framework of capitalistic thinking, this has led to a commodification of these material remains (Hamilakis and Duke 2007). According to this logic, material remains were not only our main source of information, but they also became our "capital." As such, it was natural that the more we saved of it, the better. Digging them up, saving them from destruction or oblivion, studying them, and protecting them, are all acts that we perform as archaeologists. We study the relationship between human beings and objects in the past while developing our very own relationship with these objects in the present, going as far as acting as though we possess them (Fouseki 2009). We would like to argue that recovering material remains has changed from being a professionalized hobby to a form of sacred mission ("saving our capital," as a goal per se), under the present day circumstances.

Over the past 50 years, archaeology in the western world has slowly been enforced in developers' planning processes (Willems 2009: 89). Activities were framed by laws and regulations and accompanied by self-regulatory codes of ethics and guidance for good practice created by archaeologists themselves (e.g., Society for American Archaeology – USA 1996, World Archaeological Congress – USA 1990, The Institute for Archaeologists – UK 2010 (revised), European Association of Archaeologists 2009). During this period, archaeologists struggled to impose the intervention of archaeologists every time the past was threatened (Lipe 1996), and it was generally agreed that the survival of the past depended on digging and/or preserving, and accumulating records (Lynott 1997: 593). Soon, these developments were perceived as potentially problematic, especially the concept that presented archaeologists as "stewards of the record" (Hamilakis 2003: 107; Hamilakis and Aitchison 2009 April 4th, on Radio 4 – UK, online; Carver 2010: 935). This was because, in commercial archaeology, the saving of the "record" involves using most exclusively a technically formatted report (Bradley 2006: 6).

Now, to explain and justify their activities to the public, archaeologists have often claimed that they preserve the material remains of the past for the common good and for future generations (King 2005: 28; Global Heritage Fund 2010: 11–12; Carver 2010: 935). This is a clear and simple objective, which defines a logical mission for professional archaeologists that can be understood by all.

As such, definitions of archaeological heritage management (or CRM) seem to describe a universal protective mission for archaeology, dedicated entirely to the salvation of the remains of the past.

As argued by Ferris and Cannon:

> the rise of CRM archaeology [in Ontario (Canada), is] borne of an urgency to document and recover – accumulate – the archaeological record threatened by the largely unintentional destructive forces of land use development and resource extraction [. . .] (Ferris and Cannon 2009: 2).

In commercial archaeology, this mission had been widely accepted because it simply makes sense on the daily basis, and it gives jobs and incomes to many archaeologists (Dries 2010: 57). Even if jobs are precarious and even if they involve difficult living and work conditions, archaeologists still do archaeology because they

believe in this mission that often consists uniquely of saving what can be saved (Everill 2009: 159–61; Zorzin 2010: 4, 157, 161–2).

Yet, behind this positive and virtuous frontage which gives an obvious role in society to archaeology, CRM is also a highly political device which translates the dominant preoccupations, ideologies, and thoughts of the present into the choices made for and of a past. CRM is also involved in the interpretations of a selected past (McManamon et al. 2008: 17), while it might occasionally reinforce identity and enrich the present in various ways (Holtorf 2005a: 1–15). In doing so, the individuals involved in CRM are in fact "setting the agenda" for archaeology and for national communities by facilitating or denying access to archaeological products – products standardized in various ways to echo the expectations of different clients/publics/scientists.

An Accumulative Archaeological Practice, Born Out of Capitalist Logic

According to King: "Salvage [archaeology is made] to save information for future use" (2005: 28), but this often commonly accepted goal for archaeology seems nowadays unsatisfying.

It does so because this process of accumulation allows the postponement or the discharge from all other implications that the digging can and should involve, which also entails postponing or avoiding costs. It could be emphasized here that, in terms of costs, archaeology represents a very small part of developers' budgets (Zorzin 2010: 104). The real cost of archaeology for developers is the unplanned loss of time, which might provoke an increase in costs due to material and workforce standby. In the end, because of this time and money pressure exerted by developers, it might also and simply prevent archaeology to be performed in accordance with the basics standards of archaeological or preservation practices.

This process of accumulation was created under the pressure of various cultural politics – the intermediary between the neoliberal economic logic and the practice of archaeology; archaeological activities resulted in the application of the following concepts as the right thing to do or "common sense" (Harvey 2005: 68): (1) fragmentation, (2) standardization of actions, and, most of all, (3) demonstration of profitability and quantifiability. In the short term, this resulted in a major increase in the quality and traceability of archaeological work (Bradley 2006; Willems 2009: 90), but it also came with major unexpected and long-term complications.

First, archaeological products were fragmented into different actions, by different people or organizations. Specializations appeared in archaeology, and new professions emerged with more and more specific skills, often focused on scientific data collection, analyses, and preservation (involving physics, biology, chemistry, geophysics, and computer sciences). This process resulted in a fantastic increase in the accumulation of data and artifacts, (Ferris and Cannon 2009). Moreover, fragmentation of the discipline has also led to fragmented and highly specialized knowledge that fewer people are interested in or want to pay for (Hodder 1999: 17). As a matter of fact, specialization could be seen in this case as a form of professional fetishism or as "commodity fetishism" (Marx 1867: Chapter 1 section 4). This means that a value has been given to this fragmented knowledge and recognized by all (including archaeologists) through its objective and materialistic characteristics. As such, the pieces of the puzzle (which is the past) have been multiplied but not always by keeping in mind why they were used, which questions they were intended to answer, and what problematic they hoped to resolve. As an example, many costly technologies have been introduced into commercial archaeology, such as topographical technology, which provides high accuracy in plan making, drawings, and the localization of artifacts. However, what is the point of such an accumulation of precise data without a larger theoretical questioning or simply a more global framework for archaeology? In this sense, we regard fragmentation within archaeology as a potentially fetishist feature, or as self-indulgency within the archaeologist community, to simply multiply jobs in a sector without ensuring career prospects.

Second, archaeology was standardized under more and more complex ethics codes and charts of practice, precisely defining and framing every archaeological act into a "systematic" (to use a

biochemical term, which refers to a repetitive operation that has to be performed in exactly the same way every time it is done). This "systematization" accumulated all sorts of data from sites, without any differentiation between periods, material, time frame, budgets, and most of all, without any consideration of a problematic. The virtue of such an approach is of course to avoid missing any data and preserve potential unknown data for the future. . . but it also generated a massive flow of data that we are not able to deal with and unable to hierarchize in the bigger picture.

Finally, archaeology was asked to provide quantifiable results (i.e., measurable results, numbers of m^2 excavated or protected, numbers of pits, numbers of pictures and drawings) that could justify its costs to the clients and/or to the citizens. Through this rigorous process developed in the last decades, archaeology succeeded in demonstrating its value and ability to adjust to an organization of work based on capital. CRM, clients, developers, and (sometimes simultaneously) funders were able to see and understand what archaeologists were doing. Thus, archaeologists finally gained the professional and social recognition they had been seeking since the beginning of professionalization in the 1970s. Nevertheless, this development came with a dark side. By accepting the rules of the neoliberal economy, archaeologists ended up compulsively collecting archaeological records. The result has been a routinization of work with obligations of immediate and quantifiable results, which are in fact disappointing in serving archaeology and archaeologists' interests.

Current Debates

What Is the Product, Who Is the Client?

The CRM agenda tended to convert archaeological production, initially conceived for the scientific community, for the state (by law), and in the end for the public, into an archaeological product made for developers. It should also be noted that these products are increasingly produced by private units and in smaller and decreasing proportions by universities and public services of the state (Willems 2009: 90–1).

McManamon et al. also focus on another opposed phenomenon defined by the term "community archaeology," which is characterized by an emphasis on how archaeology impacts upon people (2008: 19). This opposition between professionalization and "community archaeology" resulted in a dichotomy within archaeology. This dichotomy is problematic in archaeology caused by the impossibility for archaeologists to define a stable client for their product (as the market economy suggests). This situation leaves archaeologists torn between their own scientific interests – supporting the interests and needs of specific corporate clients or supporting the interests of the public and specific communities, interests which are often in opposition to each other. In the end, this results in archaeologists serving neither their own needs nor the ones of other clients. In all cases, it brings little satisfaction to all.

When the client/developer is paying for the archaeological act, the combination between archaeological units and clients' requirements seems incompatible. This is the case because the relationship between the two actors is unbalanced and archaeology is not in position to impose an ethic work and the highest standards of practice when the interests of the clients are in complete contrast to this. As an example, in Australia in 2011, a journalist from a *The Sydney Morning Herald* wrote: "An archaeologist claims she deleted key sections of a survey of Aboriginal heritage sites commissioned by *Fortescue Metals Group* (FMGL) [A corporation essentially extracting iron] because she feared she would not be paid for the work if she did not" (Mayman 2011).

Because of this unbalanced relation between the client and the archaeological firm, the possibility of financial pressure exists, and this is problematic enough to be emphasized. Also, in these conditions, the results of the digging process only seem to serve client interests, which are "cleaning the soil" (Demoule 2010: 14) and going against the basic objectives and codes of ethics and practice of archaeology.

This rather pessimistic situation is being countered by an initiative that was taken up some 2 years ago by a Dutch commercial archaeological company, who labeled it "Reverse Archaeology"

and whose aim is to create a win-win situation for all the parties involved – the developer, the archaeological company, the public, and local government. The idea is that archaeological practice and products could be seen as an important additional "value" to landscape and spatial planning (within the CRM logic that we referred to before), but to achieve this, one needs to reverse the archaeological process. That is, thinking about a favorable outcome before the shovel hits the soil. The idea is that the attention should be shifted from fieldwork to research goals, and one of the major key points of reverse archaeology is that we should not dig for the sake of digging alone. Location is a key factor in this process, since the outcome is connected to specific local needs – histories, communities, and economy. Because of this, in theory useful outcome, the process, could be described as "capitalizing the past," in the sense that it makes the past economically and socially "profitable" and valuable (Goudswaard et al. 2010).

Owning the Past

So far, Dutch academic archaeology has been neglecting or even mocking this initiative and accusing archaeological units of "selling out the agenda of scientific archaeology" (Holtorf 2010: 26). Academics seem to have difficulties with these ways of making the past "profitable," neglecting the fact that they are also making a living out of archaeology themselves. Besides, are academic archaeologists acting any differently? Do they not contribute in their own ways to the capitalization of the past by accumulating archaeological data and sometimes jealously withholding it from others by stacking it away in depots, turning the archaeological objects into highly wanted and valuable goods for collectors and museums?

> What is the psychology of collecting? What is it that impels people to transform their fascination with the past into a lust to own it? (Fagan 1996: 241).

Who owns the past and its remains (Gibbon 2005)? This is a subject that has been debated by many scholars lately (Cartman 2005; Duineveld 2006; Hamilakis 2007) and that has to some extent been aroused (at least in some countries) by the Faro convention of 2005 (Council of Europe Convention on the Value of Cultural Heritage for Society 2005; Article 2-*definitions* and article 12 – *Access to cultural heritage and democratic participation*). According to this convention, which has been ratified by several European countries, the past belongs to everybody and *everybody* should have some say in what (archaeological) heritage is and what we should do with it. As mentioned earlier, in the present situation, the public does not benefit directly from archaeology. Numerous material remains never make it out of the depots to be put on display for the public and for analyses, and research is not elaborated (Ferris and Cannon 2009) or often specifically produced for peer reviewing (Holtorf 2005b: 546).

So it has been suggested lately that the (research) agenda might be defined by the public, or by archaeologists in collaboration with the public, and with specific communities (Holtorf 2005b). Archaeology should adapt research agendas to a bigger public and connect to a larger public in order to be "in" the society while adopting a more pro-"-geschictscultur" (Holtorf 2010: 26). Archaeology should have a social relevance, and this can be economic and scientific, but it should be, above all, about giving meaning to the past of *everybody*.

Future Directions

What Should Be Done to Change This Situation?

By summing up the situation in Ontario, Canada, Ferris and Cannon have actually said it all:

> In short, given the scale of CRM and scale of material accumulation, the degree of degradation to existing collections occurring now, and the inability for that accumulated material to be accessed, let alone facilitate research, the status quo is simply not sustainable (Ferris and Cannon 2009: 10).

We would like to take this discourse one step further and ask the question: What would happen if we stop digging altogether? Let us pause for a second and reflect on this possibility. As archaeologists, we have been drawn into the

Archaeological Heritage Discourse (Waterton and Smith 2009) by being appointed as stewards of the remains of the past, thus *creators* of heritage. This has led us to a point where we believe that what lies beneath the soil is *potentially* valuable and thus worth conserving. Because of this, we dig. But our attachment to this materiality may lead to an unnecessary preservation and overvaluing of these "goods," producing, in the end, nothing more than a commodity (Hamilakis 2007: 16–18) while trying to cope with the effects of these objects and heritage sites on present day society. Waterton and Smith made a good point when they stated that archaeology as a discipline does not have all the answers when it comes to issues of heritage (Waterton and Smith 2009: 10). Moreover, it may actually have hindered the intellectual growth of the discipline (Waterton and Smith 2009: 5).

If archaeologists stop digging, much potential information would be lost, and we would seriously jeopardize our carefully constructed authority. The risk would be that others would take over this task without possessing the proper training-background or even affinity with the past. Needless to say, many jobs would be lost. Another risk could be that we would withdraw into our depots and libraries to dust off our previously acquired goods in order to play the role of antiquarians once again, producing specialized knowledge for the elite.

Alternatively we could maintain our presence in society and invest more time, money, and efforts in regional mapping (land-use planning, with archaeological expectations defined on a detailed level) or in preventive archaeology (by considering archaeology in a very early stage of the planning process). This would save resources on the long run and responds to one important goal of the Malta Convention: Conservation of archaeological remains in situ (Verslag 2011: 1; Reijden et al. 2011: 9–12). The present day situation of digging overly has passed by this important element of heritage management, which could be considered as an extreme form of protection. The retrieval of data and the protection "ex situ" has up to now been the cheaper solution (Verslag 2011: 9). However, it should be noted that with space being scarce in, for example, the Netherlands, the value of material remains in the soil will be viewed very critically, so records might be lost forever. Working with and for the public could make a difference in our lobby, but it may also present the possibility that some remains will be lost because the general public simply does not pay attention or is not well informed. Are we ready to accept this possibility? Especially after all our struggles preceding the Malta treaty? Is all that has been gained then lost (Newman 2009)? This is worth debating and preferably not solely in the form of a scientific and theoretical discourse but rather *within* society.

Leaving to one side for a moment our responsibility as agents of archaeological heritage, what would it mean for scientific research if we did not dig anymore? Certainly with what we've dug up so far, we could proceed for quite some time with the production of lots of interesting new facts or "old facts" updated with new knowledge. As Lucas showed, many advantages were gained in the past by those who studied material that was collected by others (Lucas 2001: 3–5). Advantages will be for example:

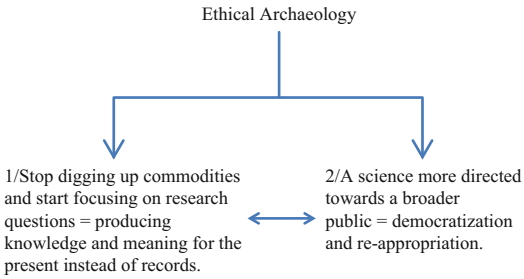
1. To stop or drastically reduce digging will force us to come up with new methods of producing knowledge.
2. It will stimulate more creativity in communicating knowledge to a larger public.
3. It will force us to cooperate on a global level with data comparison and data sharing.
4. It will create new scientific crossovers and stimulate interdisciplinary research projects with multiple research goals.
5. Other ways of producing science that is more community based will develop.
6. It will produce more efficient and innovative methods of storing and protecting our archaeological data.
7. It will produce new methods of more efficient data analysis.

An important additional benefit will be that by digging less, we are acting in a more sustainable way, taking thus our responsibility in a society that is increasingly troubled by environmental

and financial crises that strain all our resources. A sustainable archaeology would mean:

- Exploring and publishing already dug up material that is now lying unused in numerous depots
- Giving this back to the public, who financed it in previous years
- Letting the public determine new research questions
- Developing prospects for a collaborative archaeology between archaeologists and communities
- Stepping away from the logic of the commodification of the past by a redefinition of the concepts of values in heritage, redirecting this notion towards knowledge production, and social involvement instead of data and artifacts accumulation

Now, according to our arguments, the performance of an ethical archaeology could be accomplished by the following general agenda – an agenda only conceivable by taking some distance from the present economic corporate model. This agenda can be presented as follows:



In the end, to the question "is digging in itself an ethical action today?," the answer seems to be that archaeology is not in a position to create an ethical product, given the organizational or ideological constraints it has to deal with nowadays. Economic market and competitive tendering seem to have redirected and focused the interests of archaeologists on the process of digging while we argue that, nowadays, in the interests of all, digging should be limited or avoided in the long term, in order to readdress archaeological activities towards public interests.

In this entry we made an attempt to start the debate about one of the *core* activities of archaeologists. As we have tried to show, there are other archaeological activities that can be practiced as satisfying alternatives. The option of *not* digging should be sometime seriously considered by commercial archaeological companies as well as by the academic world.

Cross-References

- ▶ Archaeological Resource Management: The Changing Role of the State
- ▶ Archaeological Stewardship
- ▶ Authenticity and Pastness in Cultural Heritage Management
- ▶ Authenticity and the Manufacture of Heritage
- ▶ Avocational Archaeology
- ▶ Capitalism in Archaeological Theory
- ▶ Community Engagement in Archaeology
- ▶ Cultural Heritage and Communities
- ▶ Cultural Heritage and the Public
- ▶ Cultural Heritage in Times of Economic Crisis
- ▶ Cultural Heritage Management and Images of the Past
- ▶ Cultural Heritage Management: Building Bridges
- ▶ Ethics of Commercial Archaeology: Australia
- ▶ Global Archaeology
- ▶ Heritage and Public Policy
- ▶ Heritage Tourism and the Marketplace
- ▶ Heritage: Public Perceptions
- ▶ Journal of Cultural Heritage Management and Sustainable Development
- ▶ Materiality in Archaeological Theory
- ▶ Media and Archaeology
- ▶ Multivocality and Archaeology
- ▶ Nationalism and Archaeology
- ▶ Netherlands: Cultural Heritage Management
- ▶ Pragmatism in Archaeological Theory
- ▶ "Public" and Archaeology
- ▶ Public Involvement in the Preservation and Conservation of Archaeology
- ▶ Stakeholders and Community Participation

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Ethnic Identity and Archaeology

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Introduction

Of all forms of identity, ethnicity is possibly the one that has received attention in archaeology for the longest time. In fact, from its inception as an academic discipline in the late nineteenth century, one of the main goals of archaeology was the identification of ethnic groups in the past. In Gustaf Kossinna's words, "sharply defined archaeological cultures correspond unquestionably with the areas of particular peoples or tribes" (Kossinna 1911: 3). Many advocates of the archaeological approach to the past known as culture-history still adhere to those principles. In doing so, they turn the search for ethnic identities in the past into the primary goal of archaeology, to the point that some would now argue that to abandon the search for ethnicity is tantamount to denying archaeology its quality of a historical discipline (Bierbrauer 2008: 6). By contrast, proponents of the processualist approach to the past associated with the New Archaeology had little interest in ethnic (or any other form of) identity, as their goal was to move archaeology away from history and to bring it closer to science. Instead of answering the normative question "What do cultures relate to?," processualist archaeologists of the 1960s and 1970s concentrated on the adaptive role of the components of cultural systems, even if they still continued to accept the idea that some bounded archaeological distributions (if only in the domain of stylistic variation) correlated with past ethnic groups. A revival of interest in ethnic identity coincides with post-processualist concerns with context, symbols, agency, and history (Hodder 1982; Jones 1997). However, because in Central and Eastern Europe the culture-historical approach is still predominant, some have adopted

a completely agnostic approach, according to which ethnicity in the past is beyond the reach of archaeology, because the meaning initially attached to material culture symbols used for building ethnic boundaries will forever remain unknown (Brather 2004). Archaeologists should refrain from doing any research on ethnicity, and in the meantime focus on what they can really do, namely, study economic and social structures, social rank, religious behavior, and the like. At the root of this skepticism verging on nihilism seems to be a theoretical malaise and a profound misunderstanding of what ethnic identity is and how it works.

Definition

In the early twenty-first century, ethnicity has become the politicization of culture, a decision people take to depict themselves or others symbolically as bearers of a certain cultural identity. In the 1960s and 1970s, the debate was between those who argued that ethnicity was a matter of primordial attachments (primordialists) and those who regarded it as a means of political mobilization (instrumentalists). Today, very few would disagree with Max Weber's definition of ethnic groups as "human groups that entertain a subjective belief in their common descent because of similarities of physical type or of customs or of both, or because of memories of colonization and migration; conversely, it does not matter whether or not an objective blood relationship exists" (Weber 1922: 219). Ethnicity is not innate, but individuals are born with it; it is not biologically reproduced, but individuals are linked to it through cultural constructions of biology; it is certainly not just cultural difference, but no ethnic identity can be sustained without reference to an inventory of cultural traits. As the Norwegian anthropologist Thomas Hylland Eriksen put it, ethnicity must be regarded as the "collective enaction of socially differentiating signs" (Eriksen 1991: 141). Such an approach is largely due to the extraordinary influence of another Norwegian anthropologist – Fredrik Barth. He shed a new light on subjective criteria (ethnic boundaries) around which the feeling of ethnic identity of the member of the group is framed (Barth 1969). He also emphasized the transactional nature of ethnicity, for in the practical accomplishment of identity, two mutually interdependent social processes are normally at work – internal and external definition (the latter also known as categorization). Barth's approach embraced a predominantly social interactionist perspective derived from the work of the American social psychologist Erving Goffman. Objective cultural difference was thus viewed as epiphenomenal, subordinate to, and largely to be explained with reference to, social interaction. Studies of ethnic identity inspired by Barth thus suggest that an ethnic group is more an idea than a thing. It is not as much the group that endures as the *idea* of the group. It has been noted that cultural traits by which an ethnic group defines itself never comprise the totality of the observable culture, but are only a combination of some characteristics that the actors ascribe to themselves and consider relevant. People identifying themselves as an ethnic group may in fact identify their group in a primarily prototypic manner, with some recognizable members sharing some but not all the traits, and different traits being weighted differently in people's minds. How is this specific configuration structured and what mechanisms are responsible for its reproduction?

Attempts to answer this question resurrected the idea that ethnic groups are bounded social entities internally generated with reference more to commonality than to difference. Such an approach draws heavily from the French sociologist Pierre Bourdieu's theory of *habitus*, a system of durable, transposable dispositions, "structured structures predisposed to function as structuring structures" (Bourdieu 1990: 53). According to Bourdieu, those durable dispositions are inculcated into an individual's sense of self at an early age and can be transposed from one context to another. Ethnic identity is therefore the result of the intersection of one's habitual dispositions and the social conditions in existence within a particular historical context. That is why, once in action,

an ethnic group operates as a type of status group, the existence of which is represented through primordial attachments. In practice, ethnicity results from multiple transient realizations of ethnic difference in particular contexts of production and consumption of distinctive styles of material culture. Ethnic identity cannot be conceived without the manipulation of material culture. Ethnicity can be, and truly is, represented by such things as dress elements, speech forms, lifestyles, food ways, and the like. However, the ethnic group is not made up of the symbols used to mark it as distinct from others. Selecting symbols to mark ethnic boundaries is a political strategy in the same way that choosing a certain dress style may be for the construction of social status. Material culture with symbolic meaning is therefore an integral part of power relations, as symbols of ethnic identity appear primarily in contexts of collective rituals and other social activities aimed at group mobilization. Paul Brass even defined ethnic identities as "creations of elites who draw upon, distort, and sometimes fabricate materials from the cultures of the groups they wish to represent, in order to protect their well being or existence, or to gain political and economic advantage for their groups and for themselves" (Brass 1993: 111). Material culture is therefore not a passive reflection of ethnic identity, but an active element in its negotiation.

Historical Background and Key Issues

This idea is in fact in direct contradiction with the basic tenets of the culture-historical approach. Leaving aside the primordialist understanding of the ethnic group (to which Kossinna and his followers constantly referred as *Volk*), much more problematic from a strictly archaeological point of view is the understanding of material culture. To be sure, attempts to identify ethnic groups in material culture date back to early nineteenth-century Romanticist obsessions with finding primordial languages and homelands. Because of the Romantic concept of culture as reflecting the national soul (*Volksgeist*) in every one of its elements, Kossinna's idea was to bring to light one of those elements – the material culture – bearing the "imprint" of the ethnic group responsible for its production. Like many others in the early twentieth century, he defined (material) culture in monothetic terms on the basis of the presence or absence of a list of traits or types, which he had previously and intuitively considered as the most appropriate attributes for the definition of the culture. He stressed the use of maps for distinguishing between trait distribution patterns, which he typically viewed as highly homogeneous and sharply bounded cultural provinces. He then equated those cultural provinces with ethnic groups known from historical sources. Kossinna and his followers regarded archaeological cultures as actors on the historical stage, playing the role for prehistory which known individuals or group have in documentary history. Archaeological cultures were thus equated to ethnic groups, for they were viewed as legitimizing claims of modern groups to territory and influence. Because culture was regarded as a homogeneous, bounded whole, a direct consequence of the culture-historical approach to ethnic identity was the idea that "diagnostic" types were in fact ethnic badges. Ethnic groups could be recognized in the archaeological record by their specific *Volksgeist*, particles of which had been turned into particular types of pottery, tools, brooches, or houses. Searching for ethnic groups was thus reduced to typology, under the assumption that the classifications introduced by archaeologists approximated the categories producers and consumers in the past had in their minds. Because culture was understood as normative, wherever they would go, bearers of a certain (archaeological) culture will almost unknowingly reveal their ethnic identity to others (as well as to the archaeologist discovering their remains) by means of using specific brooches, axes, or types of pottery. Ethnicity, in other words, was all about culture, and culture operated from "behind the backs" of the people in the past (Veit 1989).

The first critique of the idea that archaeological cultures represent ethnic groups came from within the framework of culture-history, and consisted of cautionary tales, which often attributed difficulties either to the complexity or to the incomplete

character of the archaeological record (Wahle 1941). Meanwhile, by the late 1920s, the very concept of "archaeological culture" was banned from Soviet archaeology, along with "migration" and "typology." Marxism in its Stalinist version was brutally introduced in archaeology and, because of being so closely associated with nationalism, the culture-historical paradigm was replaced with internationalism that required scholars to study only global universal regularities that confirmed the inevitability of socialist revolutions outside Russia. However, following the introduction of Stalinist nationalist policies in the late 1930s, an interest in the ethnic interpretation of the archaeological record was revived, and the concept of "archaeological culture" was rehabilitated. Like Kossinna, Soviet archaeologists of the 1950s and 1960s believed that archaeological cultures reflected groups of related tribes in their specific historical development. Some even claimed that ethnic identity remained unchanged through historical change (Curta 2002).

Nor was the culture-historical approach fundamentally changed in Central and Western Europe at the end of the World War II, despite the grotesque abuses of Kossinna's theories under the Nazi regime. "Archaeological cultures" were now employed as a quasi-ideology-free substitute for "ethnic groups," without calling into question the key assumption of an intrinsic link between artifacts and groups. Barth's ideas had very little impact on the archaeological understanding of ethnicity, because his social interaction model was based on the assumption that stylistic characteristics would diffuse or be shared among social entities to an extent directly proportional to the frequency of interactions between those entities, such as intermarriage, trade, or other forms of face-to-face communication (the so-called Deetz-Longacre hypothesis). In other words, the closer two ethnic groups are to each other, the greater the probability of them sharing the same culture, without any ethnic boundaries, and thus slowly becoming one, single ethnic group. In order to verify that assumption, Ian Hodder undertook an ethnoarchaeological study in the Baringo district of Kenya, in order to understand how spatial patterning of artifacts could relate to ethnic boundaries (Hodder 1982). He found that, despite proximity and intense cultural interaction, clear material culture distinctions were maintained in a wide range of artifact categories. In his view, distinct material culture boundaries were foci of interaction, not barriers. In fact, material culture distinctions between neighboring groups were maintained in order to justify between-group competition and negative reciprocity, which considerably increased in times of economic stress. However, boundaries did not restrict the movement of cultural traits, and the diffusion of cultural styles was at times be used to disrupt ethnic distinctions. Hodder thus suggested that the use of material culture in distinguishing between self-conscious ethnic groups would lead to discontinuities in material culture distributions, which at least in theory may enable the archaeologist to recognize such groups. Moreover, the form of intergroup relations is usually related to the internal organization of social relationships within the group. Between-group differentiation and hostility may be linked to the internal differentiation of age sets and the domination of women and young men by older men (Larick 1991). Different groups may thus manipulate material culture boundaries in different ways depending upon the social context, the economic strategies chosen, the particular history of the socioeconomic relations, and the particular history of the cultural traits which are chosen to mark the ethnic boundaries.

This conclusion has been at the center of the "style debate" of the 1980s, in which a number of archaeologists argued over the communicative role of material culture. The traditional approach borrowed from art history held that each (ethnic) group had its own style, which it had preserved through history, given that cultures were assumed to be extremely conservative. In their criticism of this culture-historical approach, processualist archaeologists argued that style was a "residue," i.e., properties of material culture not accounted for in functional terms. They also argued that material culture is primarily practical and only secondarily expressive (Wobst 1977). However, style and function are not distinct, self-contained, mutually exclusive realms of form in themselves, but complementary dimensions or aspects of

variation which coexist within one and the same form. If both style and function are simultaneously present in the artifactual form, then how can one tell when, and to what extent, the observed makeup of an assemblage reflects ethnicity, and when, and to what extent, it reflects activity? James Sackett attempted to make a radical break with the residual view of style by invoking "isochrestic variation," which he defined as the practical or utilitarian variation in objective properties of material culture things that makes no functional mediation difference (Sackett 1977). To Sackett, style was an intrinsic, not added-on, or adjunct, function. As an intrinsic function of artifacts, the isochrestic variation was to be found in all aspects of social and cultural life, an idea remarkably similar to the notion of *Volksgeist* which had inspired the culture-historical approach. The isochrestic variation was the attribute of material culture through which members of an ethnic group expressed their mutual identity, coordinated their actions, and bound themselves together. Polly Wiessner argued that style was a form of nonverbal communication through doing something in a certain way that communicated about relative identity. In identity displays, efficiency of message is not a major concern. On the contrary, identity displays are often extravagant, the resources and effort expended being an index of ability and worth. Moreover, style is an intentional, structured system of selecting certain dimensions of form, process or principle, function, significance and affect from among known, alternate, possibilities to create variability. When style has a distinct referent and transmits a clear message to a defined target population, it is "emblemic style," not isochrestic variation. Given that emblemic styles are supposed to carry distinct messages, they must be consistently uniform and clear in order to make recognition and understanding possible. Since they are typically used to mark and maintain boundaries of group membership, they should be therefore relatively easy to recognize in the archaeological record (Wiessner 1983). Emblemic styles often appear at critical junctures in the regional political economy, namely, at times of changing social relations, which call for stronger or broader displays of group identity. Emblemic styles are typically associated with attempts to mobilize members of an ethnic group in situations of competition for resources with members of other groups.

Material culture is therefore fundamentally social, and artifacts are rendered "appropriate" for use only in social context. Decisions about the use of artifacts are embodied in the artifacts in terms of conventions of culture. Artifacts are not properties of a society, but part of the life of that society. They cannot and should not be treated as "phenotypic" expressions of some preformed identity. In other words, what should concern archaeologists is not so much what people do, what kind of pots or brooches they make, what shape of houses they build, but the way they go about it.

International Perspectives and Future Directions

The second decade of the twenty-first century finds the archaeological research on ethnic identity in good shape. Ethnicity in the past has frequently mobilized and divided scholarly opinion. Despite a phase of devastating post-war and more recent critique, and the reticence on the part of some archaeologists, as to whether ethnicity can be recognized in the archaeological record, the topic experienced a remarkable comeback in recent years. This may be in part because scholars can now distinguish between the archaeological study of ethnicity in the past and the historiographic study of the uses and abuses of ethnicity in more recent times. While much has been written on the influence of nationalist ideologies on the development of the discipline, there has been comparatively less preoccupation with how archaeologists participate in the production of the nationalist discourse. After all, land, when imbued with symbols, intensifies ethnic identification by means of the reclamation of archaeological sites and the repatriation of ancestral remains. The debates in the United States surrounding the Native American Graves Protection and Repatriation Act and its application in the case of the Kennewick Man have shed a new light on issues

of legitimacy associated with scientific research. Yannis Hamilakis and Eleana Yalouri have applied Bourdieu's concept of "symbolic capital" to the treatment of antiquities in modern Greece (Hamilakis and Yalouri 1996). Maintaining that the acquisition of undocumented antiquities by museums encourages the looting of archaeological sites, countries such as Italy, Greece, Turkey, Egypt, Peru, and China have claimed ancient artifacts as state (or even national) property, while calling for their return from museums all around the globe. Meanwhile, the deliberate destruction of historical monuments and archaeological sites during the military conflicts in former Yugoslavia or under the fundamentalist regime of the Taliban in Afghanistan has brought the issue of cultural heritage to the center of the archaeological debates surrounding ethnicity. In such cases, it is not only a question of global cultural heritage, but also a matter of the meaning of "other" attached to those monuments and sites by the perpetrators of destruction, who perceive them as different in ethnic terms without or with very little consideration for the distance in time separating them from past populations on that same territory (Stone 2011). Conversely, there is so far very little research on the relatively widespread phenomenon of inventing archaeological cultures to serve the nationalist propaganda, although several cases have been now recorded in Eastern Europe, Central Asia, and Latin America. The transfer of ethnic meaning from artifacts in a (national) museum to architectural monuments and archaeological sites raises the equally unexplored issue of how ethnicity participates in shows of "staged authenticity" – contrived presentation of sites as if they were authentic – which are the substance of heritage tourism. It has been noted, for example, that tourists visiting the Jorvík Viking Center in York do not contrast the staging of authenticity against direct experience of the original, but rather with a mental template of the past, which is largely shaped by mediating influences. Very little is known about the contribution of archaeology to those mediating influences.

After dwelling for years upon the mistakes of the past, especially the tendency in mortuary archaeology to "read" in ethnic terms what could otherwise be interpreted as symbols of gender identity, scholars are now beginning to realize that just as in the modern world, women in the past often symbolized ethnic collectives and were regularly regarded as biological reproducers of ethnic groups, since the ethnic group's culture is commonly structured around gendered institutions such as marriage, family, and sexuality. As ethnic identity remains a topic associated more often with research on cemetery, not settlement sites, new studies have pointed out that emblemic styles appear more often with the funerary dress of women of marriageable age. This has recently prompted a shift in research emphasis to burial assemblages which stand out from their local and regional context by cultural elements – pottery or dress accessories – apparently signaling a different ethnic background. In principle, if emblemic styles may be identified on the basis of their repetitive nature at the level of the site, then anomalies may equally be interpreted as stylistic variation in sharp contrast to the uniform background of the majority. Finally, it has become clear that the most appropriate perspective for understanding how ethnicity worked in the past is the (micro-)region (Hakenbeck 2011). By working at a local level, and with complex tools for teasing out discrete differences in material culture items which may signal emblemic styles and ethnic boundaries, and for mapping distribution patterns within and between sites, archaeologists have begun to identify the contexts of social action in which ethnic identities in the past may have been created through everyday practices.

Cross-References

- ▶ Agency in Archaeological Theory
- ▶ Archaeology and Anthropology
- ▶ Authenticity and the Manufacture of Heritage
- ▶ China: Domestic Archaeological Heritage Management Law
- ▶ Cultural Heritage Management and Native Americans
- ▶ Greece: Cultural Heritage Management
- ▶ Histories of the Archaeological Discipline: Issues to Consider

- ▶ Hodder, Ian (Modern World)
- ▶ Jorvik Viking Centre
- ▶ Kennewick Man Case: Tribal Consultation, Scientific Studies, and Legal Issues
- ▶ Nationalism and Archaeology
- ▶ Style: Its Role in the Archaeology of Art
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Ethnicity and Identity in the Ancient Mediterranean World

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Introduction

Ethnicity and identity are important fields of research within the study of the ancient Mediterranean world. They are crucial social issues within the modern world, and it seems that they were also vital in Classical antiquity. Many different types of identity are evident in the ancient Mediterranean world – gender, age, religion, rank status, legal status, professional, regional, ethnic and cultural identities being perhaps the most notable. This entry will focus on the last two forms of identity in this list, ethnic and cultural. Ethnic and cultural identities are closely linked, and it is easy to get them confused. Yet they are distinct from each other, and constitute two separate types of social categorization.

Definition

Ethnicity is generally understood as a form of large-scale social group identity, where it is believed that group members share a common descent or ancestry (Emberling 1997: 307; Hall 1997: 19-33). It is important to note that it is *belief* in a shared ancestry that is important, rather than the facts of genetic descent. Ethnicity is a social rather than a biological phenomenon, and this distinguishes it from the concept of race. Distinctions drawn along racial lines are often made with reference to biological phenomena, including physiognomic features such as skin color, physical build, and structure of facial features. Ethnicity, in contrast, is concerned with the socially meaningful distinctions between identity groups. The determining factor is not so much whether people share a genetic link, but rather whether they think of themselves as a collective and believe that they have a shared history. For example, there are relatively few biological distinctions to be made between the various Iban peoples of Borneo. However, groups such as the Undup, the Balau, and the Ulu Ai consider themselves to be ethnically distinct, and these separate ethnic identities translate into practical and political distinctions within society. Ethnicity, then, is about the differences between identity groups recognized on a social level, rather than the differences that might be detected on a biological one. Indeed, people may ascribe to an ethnic identity (or have it ascribed to them) without any accurate knowledge about their own genetic origins.

The belief about a common descent is the crucial factor distinguishing ethnicity from other forms of group identity, and it is the essential criterion that defines an ethnic identity. Other forms of group identity can also offer a basis for collective belonging, such as local village identity, professional identity, and identity associated with supporting a particular sports team. It is the concept of a shared ancestry and history that makes ethnicity distinct from these other types of group identity. It has sometimes been suggested that other factors (such as language, customs, religion, physical features, homeland, etc.) should also be considered as a part of ethnic identity. However, while these factors do often coincide with ethnicity and can be used to express and negotiate ethnicity, they do not define it. They are secondary aspects of ethnicity, and will be discussed in more detail in the following paragraph.

Cultural identity frequently overlaps with ethnicity, and in many cases, an ethnic group will develop a shared set of traditions and cultural

traits that become closely associated with their ethnicity. These might include: speaking a particular language or dialect; wearing certain types of clothing or bodily adornment; engaging in specific types of ritual or cult practice; cooking and eating particular types of food; organizing families or the household in a certain way; and using particular objects or specific forms of material culture. Although not exhaustive, this list suggests a range of different cultural factors that may become associated with group identity. These cultural factors are indeed often linked to ethnicity, and can be used as outward signs expressing or indicating ethnicity. For example, an individual living in twenty-first century France, who cooks and eats French food, speaks French, and follows in a characteristically French lifestyle, may well indeed be French in ethnicity as well. However, while these cultural factors can indeed sometimes express ethnicity, they do not always align with ethnic identity. The same individual in twenty-first century France may, for example, be ethnically Chinese, Polish, or Pakistani. The figure of Tiberius Claudius Cogidubnus presents a good ancient example of the same principle. Cogidubnus was a king of the Regnenses tribe in Britain in the late first century BCE. Cogidubnus was described by Tacitus as an especially loyal client ruler (*Agricola* 14), and a contemporary inscription from Chichester suggests that he also adopted several Roman customs (*RIB* 91). Not only did he assume three names in the Roman style, but he also dedicated a temple to the Roman gods Neptune and Minerva, and engaged in the Roman practice of erecting public inscriptions in Latin. Cogidubnus, then, seems to have embraced a Roman cultural identity in many respects, making certain Roman lifestyle choices. It seems likely however that he retained a British ethnicity, linked to his tribe, the Regnenses.

Ethnicity and cultural identity are therefore connected but distinct. Cultural factors can contribute to a sense of ethnicity, and are often an important way that ethnicity is communicated and negotiated. But they do not constitute ethnicity. Instead, the crucial factor underpinning ethnic identity is the belief in a common origin or ancestry. Although racial and biological distinctions are also often invoked as a way of articulating ethnicity, these need not have any grounding in actual fact for an ethnic identity to have social meaning.

Historical Background

Ethnicity and cultural identity are relatively new areas of study for both the Classical disciplines and mainstream archaeology. In the early and mid-twentieth century, it was generally assumed that ethnic and cultural groups were equivalent to each other, and were also straightforwardly determined by actual biological origins and race. For example, it was thought that the "Greeks" were a racially distinct population, bound together not only by blood but also by shared cultural features such as language, religion, and social norms. Certain types of object, styles of material culture, and social practices were categorized as being "Greek." For example, the Wild Goat and Fikellura styles of ceramic decoration produced in Archaic period western Anatolia are widely referred to as "East Greek" pottery styles (e.g., Cook and Dupont 1998). It was assumed that since these styles were produced in the Greek-speaking cities of the Anatolian coast, they should be understood as an eastern regional version of "Greek" ceramic types. Ethnic labels were attached to artifacts on the assumption that language, material culture, and ethnicity necessarily came together in a neat package. When applied in contexts such as this, the term "Greek" is being used as a category in a rigid system of cultural classification.

In adopting this positivist approach to identity, the Classical disciplines were in line with contemporary practice in other areas of archaeology. The Culture Historical school dominated archaeology, and the concept of discrete and bounded "cultures" was also important in anthropology (Trigger 1989: 148-206). The idea of "cultures" fell out of favor with the rise of the Processual school of archaeology in the mid-twentieth century, and there was relatively little interest in either ethnicity or cultural identity for some decades.

It was not until the late twentieth century that scholars began to reconsider the issue of ethnicity

in antiquity. In both archaeology (e.g., Emberling 1997; Jones 1997) and Classical studies (e.g., Hall 1997; Mattingly 1997), new approaches were developed for studying ethnicity and cultural identity which avoided the pitfalls and atheoretical assumptions of the Culture History school. Recent developments in anthropology and social theory have contributed to this, and the work of postmodern thinkers such as Bourdieu (e.g., 1977) and postcolonial scholars such as Said (e.g., 1978) has had a major impact on archaeologists and classicists. It was recognized that ethnicity and cultural identity were indeed distinct from each other, and the often cited equation between pots and people was broken down. It was no longer assumed, for example, that the presence of Greek and Etruscan amphorae and drinking vessels in Iron Age Gaul implied the presence of Greeks or Etruscans. Instead, scholars considered how indigenous groups could adapt both objects and social practices for their own specific ends (Yntema 2000), and new insights have been gained into the power dynamics fuelled by imported goods and social drinking in Iron Age Gaul (Dietler 1990). The distinction between ethnicity and cultural traits began to be explored. Around the same time, it was recognized that both ethnicity and culture were different from race. The notion of racial purity within ethnic or cultural groups was discredited, as increasing evidence was found for intercultural marriages and social mobility. Overall, in the late twentieth century, classicists and archaeologists came to understand ethnicity, culture, and identity in a completely new way. Ethnicity is no longer thought of as being determined by either externally visible cultural traits, or the facts of biology. Instead, it is now understood as a form of social identity, constrained by biology but not defined by it, and actively constructed using cultural traits but not predetermined by them.

These new insights resulted in a renaissance in the study of ancient ethnicity, and a widespread reevaluation of how identities in the ancient Mediterranean are conceptualized. To return to the example of "East Greek" pottery styles, these ceramics are now increasingly viewed in their local context. Stylistic relationships with inland Anatolian pottery from Lydia and Phrygia are now recognized, and the ceramic styles are now considered to be the unique products of a hybridized local "East Aegean" ceramic tradition that includes the "indigenous" areas of Lydia and Caria as well as the "Greek" regions of Ionia, Doria and Aeolis (Kerschner and Schlotzhauer 2005: 4). Similar reevaluations have been undertaken of numerous other artifact types, regions, time periods, sites, and population groups. These new ideas about ethnicity and cultural identity have allowed scholars to open up new fields of research, as well as to shed new light on old questions.

Key Issues/Current Debates

While applicable in a wide range of ancient and Classical contexts, the study of ethnicity and cultural identity has made a particularly significant impact in some specific areas of study within Classical archaeology: colonization and imperialism; cultural exchange and contact; and political rhetoric and diplomacy. Each of these areas will be discussed briefly in the following section.

The phenomenon of Phoenician, Greek, and Etruscan colonization in the Iron Age has attracted considerable academic attention in recent decades. Postcolonial approaches and the new disciplinary insights into ethnicity and cultural identity have been crucial in this. Attempts have been made to theorize the various colonization movements of the Iron Age, identifying different motivations for migration and settlement by different groups in different contexts. Colonization is rarely now thought of as a deliberate strategy on the part of mother territories for the expansion of commercial networks or the easing population pressure. It is now more frequently explained as the consequence of innumerable independent decisions made by individuals and families for personal reasons. These could include a search for private betterment and profit; disenfranchisement following political restructuring in the mother territories; or even simply wanderlust. Relationships between migrants and indigenous groups have also been rethought. They are no

longer considered to have followed the strictly asymmetrical patterns of modern European colonialism, with the colonizer dominating the colonized and imposing their culture on them. Instead, it is recognized that these relationships were often more complex than has been initially thought, with cultural influences working in both directions and new hybrid cultural forms being created from the mixing and interaction (e.g., van Dommelen 1998, 2012; Yntema 2000; Malkin 2004; Hurst and Owen 2005; Hodos 2006; Tsetskhladze 2008). Similar ideas are emerging in the context of ancient imperialism, especially with respect to the Roman and Achaemenid Empires (e.g., Mattingly 1997; Briant 2002 for Roman and Achaemenid imperialism respectively). For example, scholars no longer believe in the straightforward "Romanization" of subject populations in the Roman Empire. It is no longer thought that subject groups passively adopted Roman customs and practices, becoming "more civilized" as they did so. Rather, it is recognized that different social practices were used by different groups for different reasons, that cultural influences once more worked in both directions, and that the concept of Roman identity is in itself complex and disputed (Dench 2005; Wallace-Hadrill 2008). Unlike in the case of Iron Age colonization, the existence of asymmetrical power relations is significant, and it is recognized that subaltern experiences and resistance also offer us important perspectives on ancient imperialism (Woolf 1998; Revell 2008; Mattingly 2011). Colonization, migration, and imperialism are therefore one important area of current research.

Cultural exchange and cultural contact is another area where the study of ancient ethnicity and cultural identity has yielded especially exciting results (e.g., Riva and Vella 2006; Ulf 2008; Hales and Hales 2009; Knapp and Van Dommelen 2010). We now recognize that cultural traits do not "belong" to discrete cultures or ethnicities. Rather, they are merely objects, styles, and practices which can be used and modified to suit different social functions and different historical contexts. The presence of one particular cultural trait in an unexpected social context is no longer interpreted as evidence for one population group dominating or imposing their culture on another. For example, the presence of large amounts of Classical Athenian painted pottery in Etruria is not taken to imply the "Hellenization" of the Etruscans. Instead, we now acknowledge that the exchange of objects and ideas was often accompanied by a shift in social meaning, and that ancient cultural contact was less about the passive reception of influences and more about the active appropriation of ideas and dynamic innovations. In the Etruscan example, we now realize that the preference for Athenian decorated ceramics can tell us more about political strategies among the Etruscan elites than it can about Athenian expansionism. Using these advances in theory, it has become possible to understand phenomena such as religious syncretism or the development of creole dialects in much greater detail. For example, we have learnt much about the development of the cult of Magna Mater at Rome by understanding the processes of cultural interaction and exchange which introduced the Phrygian goddess Cybele into a Greco-Roman cultural milieu (e.g., Roller 1999). Connected to this is the question of individual identities in Classical antiquity. Individuals such as the second century CE writer Lucian of Samosata defy categorization by more traditional ethnic typologies. A Syrian by birth, Lucian was also a Roman citizen and an accomplished sophist, writing in polished Classical Greek (Mestre and Gómez 2010). In the figure of Lucian, we can see that cultural traits associated with "Greekness" and "Romanness" do not necessarily imply Greek or Roman ethnicity. Using the Greek language, engaging in Greek *paideia* (education/culture), living a Roman lifestyle, and becoming involved in Roman political debate – none of these choices prevented Lucian from claiming a Syrian ethnicity and Syrian ancestry. By unyoking cultural identity from ethnicity, and by gaining a better understanding of the relationship between the two, we have been able to take important steps forward in the study of ancient cultural contact and cultural exchange. Mixed and multiple identities, like that of Lucian, appear to be far more common than we once thought (for a variety of examples, see Goldhill 2007;

Knapp and Van Dommelen 2008; Derks and Roymans 2009; Gruen 2011a). Cultural exchange and the fluidity of individual identities are therefore another key theme in recent research.

Another important area is the issue of political rhetoric and diplomacy in Classical antiquity. The recent theorizations of ethnicity and cultural identity have generated important new insights into ancient politics and political history. In the past, scholars tended to assume that wars and alliances were conducted along ethno-cultural lines. The Persian Wars, for example, were often characterized as a "clash of civilization" between the Asian barbarian despots of the Achaemenid Empire and the freedom-loving European Greeks. However, as we now know that ethnicity is socially constructed, it is generally recognized that the conflict was far more complex than this. We have been able to identify the deliberate strategy on the part of the Athenians in particular of using ethnic ideology and rhetoric to create an image of the stereotypical Barbarian. Art, literature, and political discourse were all employed to promote this ideology of ethnic essentialism and opposition (Hall 1987; Lissarrague 2002). This ideology was part of an Athenian strategy for maintaining their own hegemony over other Greek *poleis* (city-states) through the Delian League, as they could argue that the cities should stay inside the League and submit to Athenian leadership in the face of the Persian threat. This anti-barbarian rhetoric, however, can be revealed as just that – rhetoric – given the evidence for real engagement with Persian culture on a practical level (Miller 1997). Ethnicity, we have realized, was not something essential and inborn, but rather something that can be manipulated for strategic and political ends. Important work has been done on the way that ethnic rhetoric has been used and abused in the ancient world in the pursuit of political ends. Good examples of this can be found in the use of foundation myths in kinship diplomacy. Individual cities used stories about their foundation to create links between themselves and other cities, paving the way for political alliances. During the first two centuries BCE, for example, many independent *poleis* in Anatolia claimed an ancient kinship with the Romans, on account of Rome's Trojan ancestry (Erskine 2001: 168). At the time, Rome was in the political ascendancy, and its power in the eastern Mediterranean was increasing. There were therefore many political advantages of aligning oneself with Rome, and myths of shared ancestry were a good way of achieving this. The political and strategic uses of cultural and ethnic identities, therefore, are yet another key area of current research.

There are many areas within Classical archaeology and ancient history, then, where the re-theorization of ethnicity and cultural identity has brought real changes in the way we understand the ancient world. This section has considered only a few of the most important and intensively researched of these. Many more areas are currently opening up for future research, and these will be discussed below.

International Perspectives

The study of ancient ethnicity and cultural identity is undoubtedly a vital area within the Classical disciplines. However, it has been pursued differently in different scholarly traditions. Scholars of all nationalities working in Britain, the USA, and Canada have been most active in the area to date, and have produced much of the theoretical works on the subject. This is perhaps linked to contemporary political issues in these countries, as multiculturalism, ethnicity, and identity have constituted an important part of the political discourse in these countries for some decades. Scholars working elsewhere have, of course, also contributed greatly to the study of ancient ethnicity. French scholarship, for example, has been especially important in highlighting the use of literary and visual representation in the construction of ethnicity, and for highlighting the potential for anthropological approaches to shed light on antiquity (e.g., Hartog 1980; Detienne 1990; Lissarrague 2002).

In recent years, there has been something of a reaction against the high profile of ethnicity and cultural identity within archaeology and the Classics. Some scholars have voiced the opinion that we may be in danger of overemphasizing the strategic

aspect of identity, and that while identities can indeed be manipulated and created, it is also often true that they can command considerable emotional attachment and popular belief (e.g., Kerschner 2006; Zurbach 2012). In other words, although ethnicity may not be essential and inborn, people often feel as though it is. This critique parallels discussions that have also been happening in other social sciences such as anthropology and sociology, and archaeologists and Classical scholars are increasingly taking belief and emotional attachment into account when considering ancient ethnicity.

Another critique of the study of ancient ethnicity has recently emerged, warning against the tendency to view all group identities in the past as necessarily being ethnic. The study of ancient ethnicity has been so successful, and our modern interest in ethnicity has been such a significant factor, that we perhaps assume ethnicity is important in situations where it was not. It has already long been recognized that group identities can take many different forms, and that cultural identities are distinct from ethnicity. Despite our enthusiasm to make use of the valuable new theories we have developed therefore, we should avoid the temptation to assume that all group identities are ethnic. Instead, it has been argued that other forms of group identity need to be more carefully theorized, such as local community identity (Mac Sweeney 2011).

A third major critique concerns the current tendency to conceptualize ancient ethnicity and cultural identities in terms of binary opposites, such as Greek and barbarian, Roman and barbarian, and Roman and Greek. The current established approaches to ancient identities (for which, see above) tend to privilege the view that identities were polarized into categories of "Self" and "Other." The reasons for this, it is argued, can largely be found in the historiographical and anthropological trends of the 1970s and 1980s. Specifically, structuralist approaches based on anthropology were particularly influential. It is suggested that the study of ancient identities has been overly constrained by such structuralist approaches, and that it may instead be fruitful to conceptualize identity beyond merely the opposite of the "Other" (Gruen 2011b).

These three major critiques of the study of ancient ethnicity have most often been made by scholars based outside the Anglophone academy. However, this is no longer the case, and scholars working in British and North American universities have increasingly taken up these comments, incorporating them into new models and approaches. The study of ancient ethnicity and cultural identities is a discourse which moves back and forth and where scholars of all background and nationalities are making valuable contributions (for examples, see the suggestions listed under "Further Reading," in particular, the papers in Derks and Roymans 2009, and Gruen 2011a).

Future Directions

As mentioned in the section above, three major critiques have been made of the study of ethnicity and cultural identity in Classical antiquity. This has meant that in the last few years, new directions are emerging and new research questions are being asked. Three of these new directions will be discussed here, each stemming from one of the critiques identified above: the relationship between popular and elite perceptions of identity; the interaction between ethnic and other forms of identity; and post-structuralist conceptions of identity.

Many of the Classical sources that we have for ancient ethnicity were produced by social elites. Literary texts, official inscriptions, and public iconography are the most common ancient sources used by scholars to establish as basis for an ethnic identity. These sources are most usually produced by elites, either for an elite audience or to communicate an elite viewpoint to a non-elite audience. They cannot, therefore, be taken as evidence for the views of the general populace about ethnicity or identity. For example, a Hellenistic inscription from Magnesia on the Maeander commemorated the establishment of an alliance with Phocis on the basis on ancestral kinship (Patterson 2010: 131). This inscription would have been set up in a public space, and the alliance negotiations would have been conducted by the *polis* authorities. It is not possible to be sure, therefore, what

the inhabitants of Magnesia would have thought about this. Did they believe they were ethnically linked to Phocis? Did they see the alliance as a cynical manipulation of myth for political ends? Did they consider a Phocian connection to be a plausible way of explaining their international relations? Increasingly, scholars are beginning to consider how we can explore popular ideas about ethnicity, rather than just focusing on the perspectives of elites. Necessarily, archaeological evidence has an important part to play. Archaeological material allows us to consider social practices which go unmentioned in texts and which have little impact on the public discourse. The remains of cult activities are potentially a fruitful area of investigation in this respect. Popular engagement with certain cults, and the manner of that engagement, might indicate a sense of ethnic affiliation. Exactly how this might happen, and other avenues for identifying popular conceptions of ethnicity are important new directions for future research. In order to tackle this new research direction, however, we will need to address the question of how far archaeological evidence can be used to infer ethnicity in the absence of any textual source material whatsoever. In Classical antiquity, this question is of less immediate import than in other areas of archaeology. However, it is nonetheless still a vital issue which remains to be resolved. If the essential criterion for ethnicity is the belief in shared ancestry and origins, how can this be manifested in the material record? Can the material record only show us the cultural expressions of identities, and not internalized identities themselves? Is archaeological evidence better suited for the study of cultural identity rather than ethnicity? These questions are hotly debated, with strong arguments made on both sides.

Arguing that archaeological evidence cannot illuminate ancient ethnicity in the absence of texts is not, it should be noted, a criticism of archaeology itself. Rather, this ties into the second new direction of research highlighted here. As has been already mentioned, ethnicity is one among many different types of group identity. Different types of identity come to the fore at different historical moments for different social reasons. We cannot, therefore, assume that ethnicity is always the most important type of identity. We cannot even assume it is always important at all – there may have been many situations in the ancient world where ethnicity was simply not relevant. For example, in the context of military occupation on the Roman frontier, the various collective military identities binding the soldiers together in different configurations may have been more important that any ethnic distinctions between them (Gardner 2007). Given the conditioning of contemporary society, where ethnicity and identity are burning social issues, and given the expectations we might have from textual sources, we may be tempted to assume that ethnicity is salient in contexts where it is not. Archaeological evidence, then, potentially offers scholars of ancient identities the opportunity to approach identity in an especially open way, and to investigate the way different types of identities might interact. A particularly interesting avenue for future research is this interaction between different types of identities, and the idea of slippage in the meanings of an identity. For example, a Roman identity may at different times convey ideas about ethnicity, legal citizen status, moral standing and cultural norms, or geographical location. The interplay between these various aspects of identity – the ethnic, the geographic, the legal, and the cultural – is relatively under-theorized and ill-understood.

A third new direction for future research is the reconceptualization of ancient identities in a way which does not depend so strongly on the binary opposition of Self and Other. Instead of viewing identity in terms of structuralist models of polar opposites, we will hopefully develop more complex and nuanced ideas about ancient identities, where plurality and ambiguity take the place of rigidly defined binary categories. While such ideas are generally accepted as being desirable however, it remains to be seen how new frameworks and models for conceptualizing ancient identities will be developed. Overall therefore, while we have a good understanding of the basics of ethnicity and cultural identity in the ancient Mediterranean world, we still need to move forward with more research to gain a more complex and nuanced view.

Cross-References

- Agency in Archaeological Theory
- Archaeological Theory: Paradigm Shift
- Archaeology as Anthropology
- Archaeology of Art: Theoretical Frameworks
- Central Italy: Pre-Roman and Archaic Ceramics
- Ceramics, Ancient Greek
- Ceramics, Roman Imperial
- Ceramics: Roman Republican and Early Principate
- Classical (Greek) Archaeology
- Classical Greece, Archaeology of (c. 490–323 BCE)
- Community and Archaeology
- Cross-Cultural Interaction in the Greek World: Culture Contact Issues and Theories
- Cross-Cultural Interaction Theories in Classical Archaeology
- Culture in Archaeology
- Early Iron Age Greece (c. 1150–700 BCE)
- Emporion
- Ethnic Identity and Archaeology
- Greek Colonialism, Archaeology of
- Greek Islands (Excluding Crete), Archaeology of
- Hellenistic and Roman Anatolia, Archaeology of
- Hellenistic and Roman Egypt, Archaeology of
- Iconography in the Roman World
- Lydia, Archaeology of
- Multicultural Archaeology
- Orientalizing Phenomenon: Greek Archaeology Perspective
- Processualism in Archaeological Theory
- Race in Archaeology
- Romanization
- Sicily and Magna Graecia, Archaeology of
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Ethnoarchaeology

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Introduction

Ethnoarchaeology is a subdiscipline of anthropology placed in what Binford called actualistic studies (see also the entry on "▶ Taphonomy: Definition"). Ethnoarchaeology is differentiated from other actualistic studies in that it includes the systematic observation of living societies and from other types of ethnography through its explicit focus on the intention to identify the archaeological – material – implications of human behavior. During the last 40 years, archaeologists have carried out fieldwork in traditional societies to help answer certain questions regarding the interpretation of the archaeological record and to develop and refine analogies. This research strategy has been labeled as ethnoarchaeology, and it transformed in one of the main sources of analogies. Analogy can be broadly defined as the transferal of information from one object or

phenomenon to another based on certain relations of compatibility between them. Although the use of analogical reasoning in archaeology has been subject of debates (Wylie 1985), it is a current consensus that it is necessary in every step of the archaeological interpretation (for a reborn debate about this subject, see Ravn (2011)). In the framework of analogical argumentation, ethnoarchaeology provided information from a source better known as the living societies in order to transfer this information to another less known subject – the extinct societies.

Definition

There are many definitions of the subdiscipline of ethnoarchaeology, but it can simply and basically be summarized as the acquisition of original ethnographic data to help the archaeological interpretation. There are a wide range of synonyms such as "action archaeology," "living archaeology," "archaeoethnography," and "ethnographic archaeology." It can also be defined as the study of the relationship between human behavior and its archaeological consequences in the present; it is concerned with the investigation of material culture and the built environment among living people in relation to the process which effect and affect their conversion to archaeological context (Lane 2006: 402). Among the variety of definitions and characteristics of ethnoarchaeology, one of the most comprehensive is the one provided by B. Sillar, "the study of how material culture is produced, used and deposited by contemporary societies in relation to the wider social, ideological, economic, environmental and/or technical aspects of the society concerned, and with specific reference to the problems of interpreting archaeological material" (Sillar 2000: 6). The use and application to the archaeological record of published ethnographic data (what is usually called ethnographic parallels) are not considered ethnoarchaeology, neither is the study of ethnographic collection from museum took on for archaeological interpretations in mind (David and Kramer 2001: 11; Politis 2015: 44–45).

Ethnoarchaeology has been looked upon with a degree of mistrust due to the difficulties that exist in extrapolating from contemporary information to past societies, starting with the fact that the epistemological bases of how to conduct such extrapolations are not sufficiently developed. This has generated doubts and criticism of analogical reasoning. Currently, despite certain inherent and difficult-to-resolve problem, the great majority of researchers recognize the usefulness of analogical arguments in the process of interpretation or explanation of the archaeological record and consider them as indispensable tools (David and Kramer 2001; Lyons 2013; Ravn 2011).

Another point that has generated mistrust is that to a greater or lesser degree, present-day indigenous societies – the source of analogies – have all had contact with western society and are integrated in one form or another into the process of "globalization," being part of the capitalist world. It has been proposed, consequently, that present-day societies cannot serve as analogical references for past societies because most – if not all – of them are a product of the postcolonial impact (for the Pacific archaeology, see critics in Spriggs 2008). This criticism, however, is unjustified and basically refers to the bad use of analogy rather to the analogy as way of approaching the study of the past societies. Ethnoarchaeological research operates under the principles of analogical reasoning, and therefore the two elements of analogy (the source and the subject) need not be the same (in the contrary case analogical reasoning would not be necessary), but rather there should be certain conditions of comparability between terms. Analogy's strength does not lie in the degree of similarity between source (in this case, the present-day society) and subject (the past society as perceived through the archaeological record), neither in the degree of isolation of a given society, but rather in the logical structure of the argument and the similarity between the terms of the relation (Wylie 1985). Obviously, the greater the similarity between source and subject, the greater the potential of the analogical argument, but the degree of similarity alone in no way guarantees the strength of the argument or the veracity of the statements. Moreover, it is

recognized that the power of a given analogy does not depend upon the delimitation of which traditional or "pristine" group is the source of the analogy, but rather upon its logical structure and the conditions of comparability.

As such, the subdiscipline attempts to formulate models that permit the better understanding of the cultural patterns of human societies, both in the present and the past. Essentially, ethnoarchaeology is a form of ethnography that takes into consideration aspects and relationships not approached in detail by traditional ethnographies; in some way, it is a look of contemporary societies with archaeological eyes and with archaeological questions in mind.

Historical Background

The attempt to use ethnographic information to interpret the archaeological record is neither new nor the exclusive domain of ethnoarchaeology. In the past, this use was named "ethnographic parallel," a method of using already existing ethnographic data, without defining criterion and limitation for this use and projecting or imposing it into a given archaeological case. What was new was that ethnoarchaeological information has been obtained by archaeologists themselves with the central objective of aiding comprehension of the archaeological record. At the same time, it was a great effort to make explicit the observed variables and the context of these observations. These facts make the analogical reasoning more viable and the results more accurate.

Although the term ethnoarchaeology was used for the first time in the 1900s by Jesse Fewkes in relation to the use of local knowledge of the North American Indians (David and Kramer 2001: 6), it was in the 1960s, upon the advent of processual archaeology, that archaeologists became interested in ethnographic analogy in a systematic way, realizing at the same time that ethnographers were not given proper attention to the study of material culture. In these early years, archaeologists such M. R. Kleindiest and Patty Jo Watson among the Pueblo Indians in the 1950s, Robert Asher among the Seri Indian of Mexico, and Peter White in the Highlands of New Guinea (Fig. 1) generated the first ethnographic set of data obtained with the specific purpose to aid the interpretation of the archaeological record.

Subsequently, Lewis Binford developed his ethnoarchaeological approach theoretically and conceptually in *Nunamiut Ethnoarchaeology* (Binford 1978), based on his research among the Nunamiut people in Alaska (Fig. 2). These contributions, together with Richard Gould (1980), who also performed pioneer work in the Western Desert in Australia, and John Yellen (1977)

Ethnoarchaeology, Fig. 1 J. Peter White taking notes during pioneer ethnoarchaeological research in 1964 when he was a graduate student working in Legaiyu village, Asaro Valley, Eastern Highlands of New Guinea. The people would identify themselves as Gahuku-Gama. In the picture, bamboo arrows are being made. (Photo courtesy of J. Peter White)

Ethnoarchaeology, Fig. 2 Lewis Binford and research team during field work among the Nunamiut. (Photo from the 1971 field season at Tulugak Lake, Alaska). *Left to right*: Richard Workman, Charles Amsden, Don Campbell, and Lewis Binford. On the back of the original, there is a more recent note in Binford's writing identifying it as Tulugak Lake Alaska 1971, "It snowed for 26 days." (Photo courtesy of Amber Johnson)

among the Kalahari Kung, established the foundations of ethnoarchaeology within the processual paradigm and transformed the subdiscipline into one of the most important producers of the operational models to interpret the archaeological record of the past societies.

Contemporary ethnoarchaeology emerged as a direct result of developing actualistic studies and optimism generated by the potential for such studies to explain the archaeological record everywhere. It was also an outcome of the need to construct middle-range theory in order to bridge the gap between the dynamics of the living systems and the static of the archaeological record. Consequently, from the late 1970s, and especially during the 1980s, specific studies of living traditional societies by archaeologists were carried on in several parts of the world, such as Western Iran, Alaska, Tanzania, the Kalahari Desert, India, and the Andes. Among them, some long-term, multistage enterprises, such as the Kalinga Project in the Philippines directed by William Longacre, the Coxoh Ethnoarchaeological Project in the Maya Highlands in Mexico conducted by Brian Hyden, the Mandara Project in Cameroon and Nigeria headed by Nicholas David, and the research carried by Valentine Roux and collaborators in Uttam Nagar and Haryana in India, deserved mention. As such, a new approach was developed – the search for general principles that connected human behavior to material culture and the obtaining of conclusions that did not depend exclusively on sociocultural anthropological theory.

The initial optimism of processual archaeology in the belief that human behavior was subject to laws (more or less similar to those of biology) pervaded ethnoarchaeology and oriented its conceptual development in the 1970s (a perspective still present today, Roux 2007). During these early years, there was also an underlying conviction that universal laws could be generated that related human behavior to material remains. In fact, archaeologist Michael Schiffer presumed that, together with experimental archaeology, ethnoarchaeology would be the principal source for the production of these laws. Consequently, between the mid-1960s and the mid-1980s, a great attention was given to identify and describe the process that contributes to the formation of the archaeological deposits (i.e., bone breaking and discard, use of domestic space, camp construction, and abandonment) and in the mechanisms and the physical procedures related to the production of different kind of artifacts (especially pottery and lithic tools) (Lane 2006). The research done by Susan Kent (1984) in the USA and of James O'Connell (1987) in Australia are good

examples of the mainstream of ethnoarchaeology in those times. In this period, a few local archaeologists, such as Irmhild Wüst or Tom Miller Jr., started ethnoarchaeological projects in South America (Politis 2015), although their opened research has been overlooked.

In the 1980s and 1990s, ethnoarchaeology broadened its focus and began to be included within a post-processual agenda as well. The leader of this renovation was Ian Hodder, who, after his vital ethnoarchaeological experience in the late 1970s in Kenya in the Lake Baringo area, developed a new theoretical approach (Hodder 1982). The new paradigm emphasized reflexivity and hermeneutics and was based in Bourdieu's theory of practice, all of which permeated the post-processual ethnoarchaeology fieldwork, and data collection took a more emic character (as opposite of the externalism and quantitative methodology which characterized the processual ethnoarchaeology) and resulted in a greater effort to know the *meaning* of the material culture. From within post-processualism, the range of interests that ethnoarchaeology incorporated was expanded, especially as it widened its focus beyond techno-economic aspects – which dominated the previous years – to understanding greater levels of complexity, attempting to discern material correlates of the social and ideational. Principally, this new approach reconceptualized material culture, seeking to determine the multiple dimensions in which it operates. In this sense, certain aspects are emphasized that were barely touched upon in previous research, such as symbolism and the study of non-utilitarian dimensions of material culture within society. Ethnicity, gender, style, power, resistance, and so on were among the themes boarded by this new trend.

In parallel with these main trends, basically from Anglo-Saxon origins, there is a Francophone ethnoarchaeology which has its antecedents in the classic French ethnographic studies in material culture (González Ruibal 2003: 21–22; Roux 2013). This trend is oriented toward the identification of technological procedure (pottery, metallurgy, etc.) paying attention to the broader social context and to the learning processes.

Pioneer research in this trend was made by Allan Gallay and E. Huysecom (1989) in West Africa in relation to pottery technology. Pierre Lemonier and Olivier Gosselain, both representants of the *technique et culture* school, have made significant contributions, especially the former who described and contributed to understand the *chaine operatoire*. Also, Valentine Roux (2007), with a more positivist and nomothetical approach (which is in accord with the French logicism), has been studying ceramic and bead production in India giving special attention to the learning and specialization process. She and Daniela Corbetta, a cognitive psychologist, have established transcultural standards in terms of how a particular kind of specialization can be defined and relating these standards to material signatures (David and Kramer 2001: 230). The ethnoarchaeological studies of Anne-Marie and Pierre Petrequin have also made significant contributions; their research has been done in relation to village construction around the Lake Nokoué in Benin and later on in East and Central Irina Jaya (Indonesia) where they studied, among other relevant themes, the *chaine operatoire* of two ancient traditions of ground-polished stone tools.

Finally, an emergent ethnoarchaeological Spanish tradition should be mentioned, although it does not have yet the impact of the previous ones. Spanish ethnoarchaeology has focused mainly in Eastern Africa and in South America; inside Spain rural Galicia was the place of major research interest (see summary in Politis 2015:50–53). This tradition is formed by several different lines (among many others, Domingo 2011). One is developed by the team directed by Victor Fernandez Martínez in Ethiopia which was followed by Alfredo González Ruibal (Fig. 3), which is framed in the critical theory. The ethnoarchaeological project carried out by Almudena Hernando among the Q'eqchí in Guatemala is also part of this tradition although following an original poststructuralist approach (Hernando 1997).

Although the theoretical and methodological debates have been dominated by Anglo-American and francophone voices, in the last two decades or so, several regional research traditions emerged, and pioneer works have been recognized (see,

Ethnoarchaeology, Fig. 3 The research team directed by Victor Fernandez Martinez is interviewing some Mao people (slash agriculturalists of Ethiopia). In the picture, Alfredo González Ruibal and Derrib Worku are sitting on the fiber mat talking with the Mao in 2007. (Photo courtesy of Álvaro Falquina Aparicio)

e.g., Marciniak and Yalman 2013; Biagetti and Lugli 2016). These trends, although somewhat away from the mainstream of the discussion, do refresh and stimulate the subdiscipline and expand the research, and political, agenda.

Current Debates and Future Directions

Currently, ethnoarchaeological studies had multiplied and encompassed the analysis of all types of societies, and in all the major regions of the world, long-term ethnoarchaeological projects were initiated. In recent years, ethnoarchaeological studies have been carried out in the Americas, Africa, Asia, Oceania, and Europe. Furthermore, these studies have not been limited to indigenous groups but have also included Creole peoples, peasants, and western urban societies. For some authors, such as Alfredo González Ruibal, the study of western societies should include among other subdiscipline – detached from ethnoarchaeology – named "archaeology of the present." In the same vein, it has been proposed a reassignment of the subdiscipline under the name of "archaeological ethnography" which is defined as a highly contested, cross-disciplinary, transcultural, and politically loaded space, in which the distinction between past and present and diverse public and researchers should be downplayed (Hamilakis and Anagnostopoulos 2009).

As it has been mentioned, during the 1990s and especially in the 2000s, ethnoarchaeology began to be developed by local researchers in many regions of the world. This includes Latin America, where since the 1990s several ethnoarchaeological projects, basically by Brazilians and Argentineans, are in process (see review in Politis 2015) (Fig. 4). Main areas of interest in the Andes (following the work of George Miller) are pastoralist societies and ceramic production (Fig. 5), while in the tropical lowlands, the two main subjects are hunter-gatherers and village horticulturalists, such as the Guaraní. Among others, the Africanist ethnoarchaelogy has made also significant contributions, one of which is to the understanding of how social identities are materialized at different scales, an always latent question in the archaeological interpretation (Fig. 6). Other main research subjects in this continent are the relation between space and gender, the symbolic and material practices integrated in the ironworking and the organization of craft production (Lyons 2013; Lyons and David 2019).

Hunter-gatherers have been an important focus from the beginning of systematic ethnoarchaeological research (Yellen 1977; Binford 1978;

Ethnoarchaeology, Fig. 4 A couple of Hotï Indians visiting the ethnoarchaeologists' camp and drinking their beverages. High Parucito River, Estado Amazonas, Venezuela, 2002 fieldwork. (Photo by Gustavo Politis)

Ethnoarchaeology, Fig. 5 Peruvian ethnoarchaeologist Gabriel Ramón Joffré recording pottery production in Lanche Bajo, Piura, Northern Perú in 2004. (Photo courtesy of Gabriel Ramón Joffré)

Gould 1980). More recently, these societies have been approached from a variety of theoretical frameworks, from those linked with behavioral ecology (see recent review in Bird and O'Connell 2006) to others related to historical ecology (i.e., Politis 2007) or to nonmaterialistic issues such as gender and symbolic power (i.e., Hernando et al. 2011; see also review in Lane 2014) (Fig. 6). Paradoxically, as interest grows in these studies and their contributions are valued as means of archaeological inference, "traditional" societies are diminishing, especially and dramatically hunter-gatherers, and the range of variation of analogous referents is consequently reduced. Consequently, the westernization of indigenous societies notably diminishes the availability of contemporary analogous referents that reflect some of the conditions of past societies or that are comparable in some way.

Ethnoarchaeology has been active in the more general anthropological goal of understanding and exploring other forms of thought or cosmologies, which is of great importance also to archaeology. Within this field, patterns of rationality and logical structures are looked for that differs from western patterns of rationality. This kind of research, basically proposed by Spanish archaeologist

Ethnoarchaeology, Fig. 6 Diane Lyons working with a Tigrayan potter during the Tigray Pottery Project field study in 2009, Eastern Tigray, Ethiopia. (Photo courtesy of Diane Lyons)

Almudena Hernando, is framed within post-structuralism. In this use of ethnoarchaeology, the correlation with material culture is secondary to the attempt to understand alternative cosmovisions and different logics independently of their material correlates. Some recent and provocative papers (i.e., Gosselain 2016) have criticized several dimensions of ethnoarchaeology, from the methodological shortcomings (the flaws of analogy) to the colonial ideology that permeates the subdiscipline. For Gosselain, who contrasts the current situation with the enthusiasm and optimism of the early 1990s, "The times have changed, the excitement has dropped, the magic doesn't work anymore." Although some of the critics raised by Gosselain might be true and would invite to profound reflection, most of them are made against an old-fashion, out-of-date, and politically naïve mode of doing ethnoarchaeology. The paper from Gosselain does not encompass the complexities and heterogeneity of current ethnoarchaeology, neither the ongoing methodological, theoretical, and political debates inside the subdiscipline (see, e.g., the articles from *World Archaeology*, 2016 48 (5)). A complete and well-informed answer to Gosselain can be found in Lyons and David (2019).

In spite of same pessimist forecasts and against the argument that ethnoarchaeology has little impact on "real archaeology" (see discussion in Skibo 2009) and that the application of the generated models is limited (Hegmon 2000; González-Ruibal 2008), the subdiscipline is increasingly influencing the archaeological reasoning and is occupying a central place in the theoretical debate (see *World Archaeology*, 2016 48 (5)). More and more, archaeologists are using the results of ethnoarchaeological research to generate hypothesis, to build interpretative models, and to test the validity of their assumptions. The reduction of traditional societies, and/or modes of life, is compensated with the redirection of the ethnoarchaeological study toward segments or subgroups of contemporary western societies, orienting the research toward a sort of "ethnoarchaeology of us." However, the methodological procedure to integrate this new set of results into the interpretation of the archaeological record of past societies still needs to be properly developed. There is a methodological gap in the analogical reasoning that needs to be covered.

As a corollary, it should be noted that, besides providing analogues in an operative way to be applied in the interpretation of the archaeological record, one of the main contributions of ethnoarchaeology is the mitigation of the ethnocentrism that permeates the archaeological view of the people in the past and the interpretation of the long-term human experience. The subdiscipline is also helping in creating the history of the "others," in their own terms, as much as this is possible, and in the long term. Finally, ethnoarchaeology, with its particular look upon contemporary societies, both traditional and western, is making a great input not only in the understanding of present and past human behavior but also in archaeological theory building.

Cross-References

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- Post-Processual Archaeology
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Ethnoarchaeology of Pastoral Societies

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Introduction

Ethnoarchaeological research programs on pastoral societies have been relatively few in number, yet many of them have had a tremendous impact. The archaeology of pastoralism has enormously benefited from the studies carried out throughout the last 50 years among current herders, inspiring and orienting archaeological research on a variety of past systems based on animal husbandry. The alleged "invisibility" of archaeological pastoral sites has been challenged precisely on the basis of ethnoarchaeological research, and nowadays archaeologists are able to tackle and decode ancient pastoral landscapes, no matter their geographic or chronological context. More sophisticated reconstruction of ancient nomad-sedentary interactions, on past mobility and settlement patterns, and on the formation processes of the archaeological pastoral sites is currently performed, thanks to the pivotal role played by a set of ethnoarchaeological research that paved the way to a more nuanced understanding of pastoral systems. The ethnoarchaeology of pastoralism has not only provided invaluable support to archaeology but has also contributed in designing suitable strategies to deal with mobile systems both in the present and in the past, configuring approaches to landscapes, sites, and artifacts related to non-sedentary societies.

Definition

Ethnoarchaeology became part of current archaeological practices in the 1950s (David and Kramer 2001). Encompassing research carried out on present-day communities with archaeological purposes, ethnoarchaeology revolutionized archaeological theory and practice from the late 1960s under the advent of the so-called New Archeology. Either considered as a research strategy, a sub-discipline of archaeology, or even a discipline on its own, the many definitions of ethnoarchaeology that have been proposed through the years (David and Kramer 2001: 12, Table 1.1) testify to the pluralism of perspectives that characterizes this line of studies. In recent years, an effective contribution toward the outlining of ethnoarchaeology's scope and functions has been traced by Skibo (2009: 47), who emphasizes how ethnoarchaeology can contribute in building theoretical models to be used by archaeologists who are seeking to make more sophisticated inferences about the relationships between material remains and human behavior. In this entry, "ethnoarchaeology" is defined as the study of the present to generate interpretive models for the understanding of the past.

The term "pastoralism" has been variably used to define socioeconomic systems based on animal husbandry in ethnohistorical literature from the twentieth century onward. Classificatory and normative typologies (e.g., Khazanov 1984) have proven not very useful to frame the debate around pastoralism, universally characterized by a large degree of intrinsic flexibility (Salzman 2002). Strict typologies are largely ideal and poorly suited to approach extremely nuanced and opportunistic systems, where different variables are continually recombined. In this entry, pastoralism

is defined as a socio-ecological system based upon animal husbandry, characterized by the predominant role of the stock from the economic, ideological, cultural, and social points of view.

Historical Background

Early Stage: The Ethnography of Pastoralism (1920s–1960s)

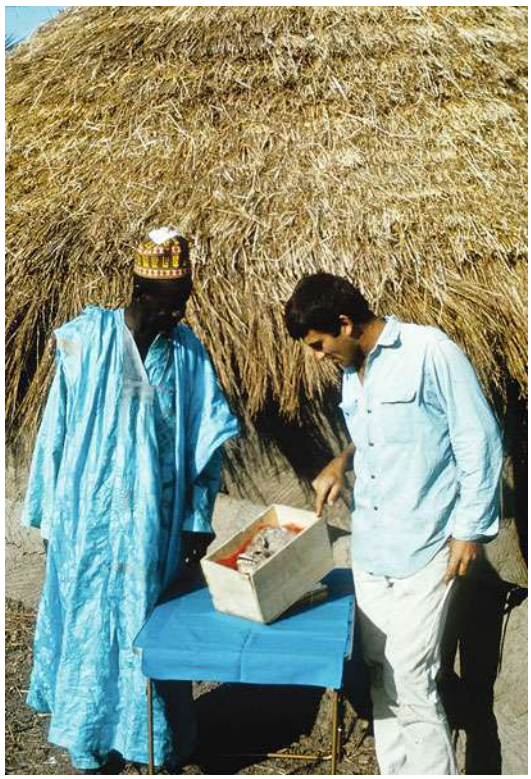
From its inception, archaeology focused and developed around the concept of site, in relation with the excavation of classical and historical settlements in the Old World. Monumental, massive, and recognizable vestigial of ancient civilization were the hallmark of the birth of Archaeology in the nineteenth century. As a result, more ephemeral forms of human frequentations were simply out of the scope of archaeology. Those interested in the study of mobile pastoral societies were not provided of any robust methodological nor theoretical framework to support their investigations. The study of prehistoric and historical pastoralisms has traditionally posed serious challenges for archaeologists. Highly mobile and lightly equipped, ancient pastoralists remained a "problem" in the archaeological literature for a long time. Scholars have long been questioning the possibility of finding the remains of ancient herders, due to the elusive and ephemeral character of pastoral campsites.

Partially due to the abovementioned reasons, ethnography has always been a major source of data for those interested in the study of the ancient pastoralism. In their encounters with pastoral societies in the Old World, Westerner ethnographers from the early and mid-twentieth century have made large use of typologies and labels. Due to the necessity of pinning down such different socio-ecological and political systems, and fueled by the debate around the existence of pure pastoral societies (i.e., societies whose food production and consumption were predominantly or almost exclusively based upon livestock and its by-products), ethnographers built ideal frames of reference to approach non-sedentary societies. Comparative studies of pastoralism took into account the geographic constraints to elaborate a narrative around stock-keeping in ancient times in a very prescriptive way. From the 1940s to 1960s and onward, seminal ethnographies were published. Those works represent milestones in the anthropology of pastoralism and share a structural functional approach, where regular patterns of production, seasonal movement, and modes of resource exploitation were portrayed. As a result, seemingly unvarying cycles were described in details, leaving little room to anomalies or divergences with respect to those patterns. However, the severe droughts that hit Africa in the 1970s–1980s with the consequent dramatic effects on pastoral economies generated a renovated interest by social anthropologists toward herding societies. In the postcolonial era, new investigations were carried out among pastoralists in the Old World, which were often characterized by a shift in the theoretical background and a progressive abandonment of strict deterministic positions. As such, the debate focused on the relations between ecology, society, policies, and adaptation (Salzman 2002, therein references) and assumed more complex nuances. The variability and the opportunism of pastoral societies were recognized as key elements of this livelihood, and the discussion was therefore framed also around them.

The Birth and Development of the Ethnoarchaeology of Pastoralism (1970s)

The wave of the New Archaeology, and the widespread feeling for a more anthropologically oriented archaeology, fostered the first explicitly ethnoarchaeological research programs on pastoral societies. In the 1970s a series of papers reflect the need and the interests by archaeologists in getting more precise data about material culture, sites, and land use in pastoral communities. It is well known that, beside the detailed description of a given society, in fact, traditional ethnography does not take into account the material dimension of human behavior, and thus quantitative information about artifacts, architecture, and landscape are generally limited. Unfortunately, this is precisely what archaeologists need in order to make inferences about the past societies based on the recovered material evidences of human occupations, which often result in mere scatters of artifacts and ecofacts. One of the earliest works focusing on material culture is that from Robbins (1973),

providing us with the first ethnoarchaeological study on the Turkana, a pastoral society from East Africa. In his "Turkana Material Culture Viewed from an Archaeological Perspective," Robbins noted all the type of artifacts recorded at selected Turkana campsites, their position, their uses, and their perishability and ultimately discussed the implications of his observations under an archaeological perspective. In the same years, Nicholas David (Fig. 1) published his "The Fulani Compound and the Archaeologist" (1971), where he explored present-day compounds inhabited by settled pastoral Fulani in Cameroon, with the aim of illustrating how an ethnoarchaeological approach can lead to more refined interpretation of archaeological households. To understand the degree of fit between households and their buildings, David (1971: 111) stresses that "...we must seek for analogies from ethnography and (...) test their appropriateness and



Ethnoarchaeology of Pastoral Societies, Fig. 1 Nicholas David and the Lamido (chief) of the settled Fulani of the village of Bè, N. Cameroon. (Courtesy Nicholas David, picture taken in 1968)

generate new models when these are required to fit the excavated data. The available ethnographic models are unfortunately quite inadequate" (Fig. 2). The quest for the identification of pastoral sites was further developed by Frank Hole (Fig. 3), one of the earliest ethnoarchaeologist dealing with herders' settlement pattern. In his research in Luristan (Iran), he identified the main factors driving the selection of settlements in relation to pasture and water and their relationship with a set of other physiographic variables (Hole 1979). The importance of his work lies in pinpointing a number of useful observations to design research programs on pastoral societies worldwide, overcoming the supposed "invisibility" of pastoral sites due to the high mobility and light equipment of herders.

The Age of Maturity (1980–1990s)

Hole's work influenced the research by Roger Cribb, who studied nomadic societies in Cilicia (Turkey) in the 1980s. Cribb's main publication *Nomads in Archaeology* was later issued in 1991 and highlights the migratory and settlement patterns, along with nomadic architecture and intra-site spatial observations, including notes on the abandonment and reuse of campsites, plus a rich collection of maps, plans, and photographs. He significantly compares (1991: 5) the ethnographic present to a laboratory in which phenomena can be studied under controlled conditions. He continues (1991: 5) stressing that "...In documenting the spatial organization of contemporary nomads I am not attempting to map this organizational structures onto ancient nomads" and that "...it is the tools forged in the ethnographic setting which are imported into the past, not that setting itself." In the 1980s–1990s, a number of scholars carried out research programs on the ethnoarchaeology of pastoral societies, following the path opened in the 1970s, from North, South, and East Africa to Southern Europe, to the Andes, the Levant, and the near East, and Central Asia, exploring also less tangible aspect of material culture (Hodder 1982). Another similar piece of research to Cribb's is the book *Nomads in the Archaeological Records* by Rebecca Bradley (1992), where the author presents her archaeological and ethnoarchaeological fieldwork carried out in Sudan in 1979–1980. Bradley reinterprets the

Ethnoarchaeology of Pastoral Societies, Fig. 2 Fulani pastoralists taking care of cattle belonging to settled Fulani of the village of Bè, N. Cameroon. (Courtesy Nicholas David, picture taken in 1970)

Ethnoarchaeology of Pastoral Societies, Fig. 3 Frank Hole in the field (courtesy Frank Hole)

archaeological evidence from the Kushite age in the Butana region under her direct ethnoarchaeological observations from contemporary nomadic pastoralists and sedentary agriculturalists from the same area and argues that – contrary to mainstream theory that leaves no place to pastoralists in the Kushite state – nomadic pastoralism was likely an important component in Kush society. The edited volume

Pastoralism in the Levant: Archaeological Materials in Anthropological Perspective (Bar-Yosef and Khazanov 1992) includes a number of relevant papers aimed at identifying tangible and visible traces of pastoral campsites. Claudia Chang's long-term research in Greece and the Balkans represents another outstanding example of the application of ethnoarchaeology to a wide array of aspects of pastoral societies (e.g., Chang and Tourtellotte 1993). All those publications also engage with the issue of the abandonment of pastoral campsites and explore what is left at the settlements once the pastoralists have gone. This is one of the fields where, in my opinion, ethnoarchaeology of pastoralism has deeply enhanced the archaeology of mobile societies. Along with the above mentioned publications, a 14-month ethnoarchaeological research on a southwestern Bolivian agropastoral society was published in the early 1990s (Tomka 1993). Although focused on a community practicing a mixed economy, the study largely explores the abandonment of pastoral sites, where the author identifies a peculiar mechanism operating, which he calls "delayed curation." According to his observations, even the abandonment of sites is a dynamic and continuous process and does not merely consist in a non-occupation of a previously frequented settlement. Rather, under the "delayed curation" perspective, previous inhabitants keep collecting usable artifacts that had been cached in view of potential future reoccupations. Delayed curation is ". . .the mechanism by which elements of these cached assemblages are slowly withdrawn from these residences as the length of episodic abandonment increases and the probability of future reoccupation diminishes and finally becomes unlikely." There is little doubt that similar phenomena are to be recorded in other cases (e.g., Biagetti 2014: 99–142; Fig. 4) and constitute recurrent and peculiar characteristics of pastoral landscapes.

Ethnoarchaeology of Pastoral Societies, Fig. 4 Interviewing and visiting at a recently abandoned Kel Tadrart campsite, SW Libya. (Photo Stefano Biagetti, courtesy Archive of The Italian Libyan Archaeological Mission in the Sahara)

Key Issues/Current Debates

The Advent of Geo-Ethnoarchaeology

It is not by chance that the term geo-ethnoarchaeology was used for the first time with reference to the study of a system of prehistoric caves frequented by pastoralists. In the early 1990s, Jacques Brochier and colleagues (Brochier et al. 1992) published "Shepherds and Sediments: Geo-ethnoarchaeology of Pastoral Sites," pointing out a so far unexplored set of indicators to be taken into account in the study of ancient pastoralism. Their paper clearly illustrates how mineral residues of dung represent diagnostic and likely universal non-faunal criteria for the identification of herding activities at archaeological sites. Brochier and colleagues devise a geo-ethnoarchaeological approach to dung, the most ubiquitous and unambiguous proxy of pastoral frequentation, and resume (Brochier et al. 1992: 47): "... that the most important durable indicators are the mineral residues of manure accumulated in sheep/goat pens and other physical traces of animal enclosures, namely: (1) spherulites, microscopic crystals of a calcium salt, diagnostic indicators of ovicaprine dung; (2) layers of burnt dung; and (3) rock polish produced by sheep/goat fleece and hooves on cave walls and stone blocks." Ten years later, the results from a research program carried out in East Africa were published in a series of papers (Shahack-Gross 2017 and references therein). Shahack-Gross and colleagues identified the mechanisms of degradation of dung deposits and their markers, thanks to the observation and analysis of samples from contemporary and early campsites. The procedure therein adopted allowed the authors to build general laws related to the formation of pastoral archaeological sites (sensu Skibo 2009) on the basis of the geo-ethnoarchaeological study of microremains included in dung deposits. The importance of those methodologies lies also in shifting the focus of research away from bones, architecture, and artifacts and targeting the most unequivocal by-product of pastoral occupations. Current research (Égüez et al. 2018 and references therein) is focusing on the recognition of proxies suitable for geo-ethnoarchaeological analyses (Fig. 5), with the aim of exploring the potential of pastoral deposits in the present in order to drive archaeological research and interpretation.

Pastoral Landscapes, Resources, and Resilience

Since Hole's research (1979), ethnoarchaeologists realized that a full understanding of any pastoral societies should embrace a landscape approach. Recent developments in Geographic Information System allow exploring the relationships between human communities and their territories and resources at large scale. The availability of (also free) high-resolution satellite imagery, which can even by obtained free of costs, provides an

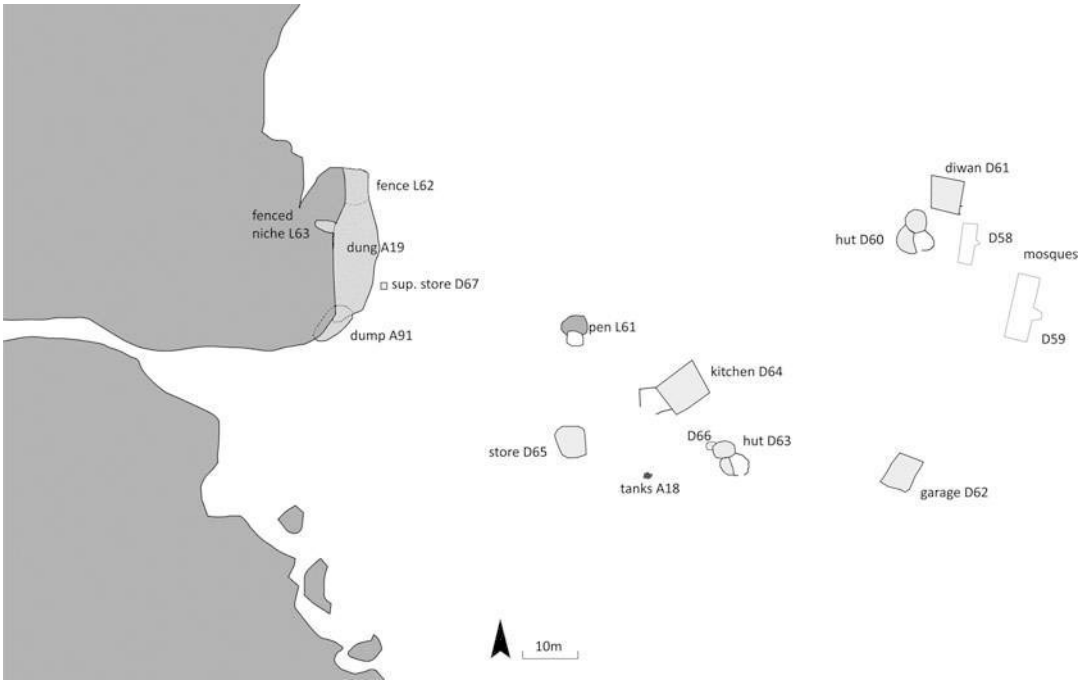
Ethnoarchaeology of Pastoral Societies, Fig. 5 Stefano Biagetti and Andrea Zerboni collecting geo-ethnoarchaeological samples at a contemporary corral from the area of Omdurman, Sudan. (Photo and courtesy Carla Lancelotti)

unprecedented support for territorial research on mobile populations. Previously hardly accessible landscapes can now be visually inspected in short time through Earth observation, and a variety of projects include the remote monitoring of land use and the tracking of changes in the availability of natural resources. In this frame, the study of "regions" is being carried out under fresh perspectives. Instead of adhering to strict ecological determinism, ethnoarchaeologists are demonstrating that the adoption of the concept of resilience (i.e., the capacity of a system to withstand change without modifying its characteristics) is rather suited to frame the investigation around pastoralism, focusing on its multifaceted and flexible patterns of mobility and use of resources. Opportunism is the hallmark of pastoralism, and ethnoarchaeology has shed light on it. For instance, the study of current resilience of pastoral communities in hyper-arid environment is demonstrating that variability and flexibility can characterize pastoral lifestyle also in deserts, escaping an ecologically deterministic perspective, with relevant feedback on the reconstruction of past cultural trajectories as well (Biagetti 2014). The application of advanced geostatistical techniques and modelling is also being used to study European pastoralism. In the study of pastoral landscapes, Carrer (2013) proposes an ethnoarchaeological inductive model for predicting archaeological sites in the western Italian Alps (Fig. 6). The novelty of his approach lies in the adoption of quantitative ethnoarchaeology to successfully predict the location and the function of a number of archaeological sites. Both authors publish a number of maps and sketches (Fig. 7), often missing from papers on ethnoarchaeology of pastoralism. Increasing use of remote sensing, coupled with geostatistics and quantitative approaches, represents a promising avenue for the development of GIS-based ethnoarchaeology of pastoralism.

Pastoral Material Culture Reloaded: Biochemistry

The study of organic residues in archaeological artifacts represents one of the most rapidly growing fields of archaeological sciences. In the last 20 years, a series of study has stressed the potential of the analyses of absorbed residues in ancient pottery, shedding light on diet and subsistence practices of early pastoralists worldwide. Dunne, Grillo, and colleagues (2018) have recently explored the advantages of carrying out such chemical analyses from potsherds whose lifetime use is known, in likely the first (and so far, only) ethnoarchaeological study on organic residues carried out among current pastoral communities (Fig. 8). In their research carried out in Samburu region (Kenya), the authors stress that the results from chemicals analyses of organic residues do not reflect the relative importance of all the various types of food processed in vessels and that

Ethnoarchaeology of Pastoral Societies, Fig. 6 Recently abandoned dry-stone structure used up to few years ago to make cheese in the area of Monregalese, Cuneo, Western Italian Alps. (Photo and courtesy Francesco Carrer)



Ethnoarchaeology of Pastoral Societies, Fig. 7 Plan of a Kel Tadrart inhabited campsite in 2007, SW Libya. (Elaboration by Stefano Biagetti)

Ethnoarchaeology of Pastoral Societies, Fig. 8 Samburu woman preparing a pot for use by smearing it with wet cow dung, Rift Valley province, N-Central Kenya. (Photo and courtesy Katherine M. Grillo)

some foods result as hidden in terms of residue analyses. A very fresh study has been looking to contemporary dung deposits from Eastern Mongolia to identify their molecular and isotopic fingerprints, in order to build a reference for identifying evidence of patterns of stock management and animal diet (Égüez and Makarewicz 2018). Considering the growing importance in isotopic studies in archaeology, that paper represents an important ethnoarchaeological work providing insights on the isotopic signatures left at present-day pastoral campsites. In both case studies mentioned, the role of the present is therefore pivotal to orient archaeological research also in the case of its hard science applications.

International Perspectives

The recording and preservation of a body of intangible knowledge related to animal husbandry is a widespread and international concern. Supranational organizations are claiming for the integration of local knowledge and indigenous perspectives in the designing of sustainable strategies of development. Ethnoarchaeology is uniquely placed to bridge the intangible knowledge of pastoral societies with the tangible body of their artifacts, settlements, and landscapes. Being focused on both material and nonmaterial

aspects of cultures, ethnoarchaeology is ideally suited to mediate between stakeholders and local communities when some kind of intervention is planned. Pastoralism is likely declining everywhere, as a result of the global trends toward urbanizations and sedentarization. Nevertheless, many societies keep living in a set of regions where animal husbandry is certainly the most productive and sustainable form of food production. Ethnoarchaeological research programs have been contributing in unveiling the facets of pastoral adaptation to regions generally considered as marginal or hostile, such as arid lands or uplands. Ethnoarchaeological studies in pastoral adaptation and resilience hold the merit of highlighting the most relevant characteristics of pastoral adaptation and lifestyle in many regions of the world, (re-)orienting archaeological investigations to less evident – though not less recognizable – features of the archaeological landscape.

Future Directions

In spite of the overall decline of pastoralism, the ethnoarchaeology of pastoral societies will likely represent a vibrant field of research in the next decades. Advances in remote sensing techniques, geo-ethnoarchaeology, and chemistry will likely play a major role in the ethnoarchaeology of pastoral societies A remarkable and relatively recent phenomenon is represented by the inclusion of other pastoral contexts that have raised little or no ethnoarchaeological interest to date. Among those, fresh ethnoarchaeological literature on pastoralists and reindeer herders from Mongolia is definitely worthy of note (see further readings). On broader level, the study of resilience and adaptation of current pastoral societies under an ethnoarchaeological perspective is contributing to challenge the general perception about herders and their settings. Far from being peripheral communities characterized by variable degree of contact with sedentary hotspots (villages, oases, cities), ethnoarchaeological studies of pastoralists around the world are demonstrating how allegedly "marginal" areas (e.g., hot and cold drylands, mountains) and its inhabitants can play an active role in the historical and cultural trajectories. In fact, those regions are home to original and creative developments that ethnoarchaeological approaches are unveiling, opening thus new windows on more inclusive and elaborated reconstruction of past dynamics, where pastoral societies are a non-secondary component. Current ethnoarchaeology of pastoral societies is therefore not only shedding new light on past herding communities, but it is configuring as a key approach to understand the complex network of social, ecological, and economic factors that drive the interactions between pastoralists and the outer world in a historical perspective, taking into account both the material and the intangible domain.

Cross-References

- ▶ Animal Domestication and Pastoralism: Socio-Environmental Contexts
- ▶ Ethnoarchaeology
- ▶ Ethnoarchaeology: Building Frames of Reference for Research

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Ethnoarchaeology of Salt in Romania

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Introduction

Hallstatt, Vallée de la Seille, and Halle/Saale have been, for more than a century, famous European archaeological sites connected to the prehistoric exploitation of salt. The number of such sites has gradually increased, with the last three to four decades witnessing an unprecedented research impetus across all continents, which consolidated the syntagma Archaeology of Salt. Starting in the 1970s, Southeastern Europe became the spotlight in this regard, producing evidence of the worlds' oldest (Neolithic and Chalcolithic) production of recrystallized salt from salt springs (Bosnia-Herzegovina, Romania, and Bulgaria).

Southeastern Europe is one of the rare areas of the continent with considerable ethnoarchaeological potential. It began to be valued through significant approaches beginning in the 1980s (Nandris 1985, 1987). Despite the progress, this potential is still far from being exhausted (Zidarov and Grębska-Kulow 2013). The importance of ethnoarchaeological research in these resilient areas is enormous for the proper understanding of many archaeological situations in Europe and beyond. This transgressive assertion is justified by the appeal to the classic distinction between the two types of ethnographic analogies. The first operates in the conditions where the two sets of data – archaeological and ethnographic, respectively – are very disparate in time or space or in both and no connection can be demonstrated between the culture that produced the archaeological traces and the culture that provides the ethnographic analogies (Stiles 1977). The second type of analogy is practiced when it is possible to attest a connection in time and/or space between archaeological and ethnographic cultures; in this situation, a degree of continuity can be assumed between past and present. This latter kind of analogy was the basis for the definition of the direct historical method (Ascher 1961). Thus, most researchers believe that this type is most likely to be correct because the time, space, and cultural affinity conditions that produced the two sets of data under comparison are almost analogous.

Romania's ethnoarchaeological potential for salt was highlighted in the last decade of the last century by a pioneering study (Alexianu et al. 1992). In many mountain and hill micro-areas, Romania meets the ideal conditions for undertaking ethnoarchaeological research focused on investigating the role of salt in the evolution of prehistoric communities. This is because this country:

(a) Is very rich in salt deposits and various saline manifestations.
(b) Shows a remarkable density of archaeological sites, close to some salt springs, the oldest evidence for salt production in Europe, and probably worldwide (Weller and Dumitroaia 2005). Here is the so-called trough technique, first investigated in Transylvania (Harding 2013, 63–66; Harding and Kavruk 2013, 47–94).
(c) Still has a number of resilient areas where traditional salt production, distribution, and rituals in rural, and sometimes even urban, areas continue to this day at an unexpected degree of intensity for an EU member country (from 2007).

In the following, I expand on these three characteristics:

(a) Salt deposits on the Romanian territory (Romanescu et al. 2014, 2015) are found in two large areas: the Subcarpathians and the Transylvanian Depression. The area of Romanian sub-Carpathians unfolds along the external margin of Eastern and Southern Carpathians. In terms of altitude sub-Carpathians are hills, while in terms of genetics they are mountains. Salt deposits were created in the lagoon areas situated near the mountain frame. The chemical differences between salt deposits in the sub-Carpathians and in Transylvanian Depression are due to local conditions. Salt

deposits within the sub-Carpathians are mixed with carbonates and sulfates, while the salt within the Transylvanian Depression is pure (only halite). The lack of magnesium and potassium salts in the Transylvanian Depression is due to the existence of connection pathways with the open ocean (waters with high concentration of magnesium and potassium are evacuated from the Transylvanian lagoon). In the sub-Carpathians, there are 2–4 layers with different ages, while in the Transylvanian Deposits, there is only one, with a thickness of 400 m. Considering an average seawater concentration of 35%, the following salts are deposited: 78% halite, 17.7% complex potassium and magnesium salts (chlorides, sulfates, etc.), 3.6% gypsum, 0.4% dolomites, and tiny amounts of bromides, iodides, etc. The different percentages of these elements determine the differentiation of salt deposits in Romania. In Romania there are approximately 200 salt massifs and around 2000 salt springs. As far as saline springs are concerned, their accessibility throughout the prehistory and history is obvious, while only a small part of the salt masses could be exploited in pre- and proto-history depending on the depth at which they were located.

(b) The archaeological discoveries on the territory of Romania cover all pre- and proto-historical periods. Some of the archaeological cultures are considered landmarks for European prehistory (e.g., Starčevo-Criş and Cucuteni-Trypillia). In the last half century, the research on the archaeology of salt has boomed in Romania (Alexianu et al. 2011; Harding 2013; Harding and Kavruk 2013). At least two areas are of maximum relevance: the sub-Carpathian area of Moldova, where the oldest traces worldwide of saline springs exploitation were discovered (Weller and Dumitroaia 2005), and the Băile Figa area (Transylvania), where a new technique was discovered for the exploitation of salt and salt sludge deposits – the "trough technique" (Harding and Kavruk 2013).

(c) After World War II, Romania came into the Soviet Union sphere of influence. Even the introduction of the Soviet-inspired kolkhoz system only partially destroyed the ethnographic fabric of the rural Romanian communities, since this system was inapplicable in the mountainous areas of the country that lacked large surfaces suitable for agriculture. After the changes in the political and economic system in Romania in 1989, private initiatives in the rural areas developed as the process of reconveying the lands subjected to collectivization was in full swing. Independent from the great agricultural exploitations, individuals and families still possessed small farms with a pronounced autarchic character, based on agricultural production and animal husbandry. Even today, although they benefit from modern amenities and facilities (good roads, mobile phones, electricity, television, etc.), many Romanian villages still practice an ancestral form of subsistence economy, sometimes even employing caballine and bovine methods for agricultural work or transportation. These particularities of the Romanian villages clearly set them apart from those of Western Europe, with the Romanian villages maintaining direct, organic relations with the natural environment. This phenomenon of the organic integration of the villages with the environment led to a resurgence of traditional behaviors and the practices of direct exploitation of all the available ecological resources. There is, however, a natural element, which, even when found on private property, is accessible to the entire community; salt springs or salt outcrops are considered a "gift from God" (Alexianu et al. 2007). The change in the economic system in 1989 encouraged private initiatives related to animal breeding (animals need large quantities of salt, including liquid dispersal) and to production and conservation of food. Another element which facilitates the salt springs' exploitation is the fact that these are generally situated on lands belonging to the state or are owned as common property. Consumers can therefore decide to access them freely without the slightest financial, legal, or administrative restrictions or regulations. In a certain sense, one can speak oxymoronically about an unprovoked ethnoarchaeological experiment taking place, as the presence of such community access offers the possibility of investigating at firsthand resurrected traditional behaviors and practices that supply all

the elements necessary for the proper functioning of an autarchic economy. In other words, we are witnessing a phenomenon of resiliency unfolding as we speak, which, in a certain way, is somewhat atypical.

A Brief History of Research

Earliest Literary Sources

The traditional exploitation of salt springs in Romania which is mentioned is a work almost 250 years old. The oldest evidence is found in a record of the salt deposits of Transylvania. Its author, part of the Austrian administration who spent most of his life in the region, mentions an unusual technique for obtaining salt crystals by splashing red hot embers with salt spring brine (von Fichtel 1780). The veracity of the account was confirmed by a 1783 manuscript by an Austrian functionary, who conducted a field investigation of the salt springs of Bukovina (Ceausu 1982, 379). The same technique was further described in a travel journal of an English natural historian, mineralogist, and medical man: "It is worth remarking, that the present rude inhabitants of Moldavia and Transylvania, who live in the neighbourhood of salt spring, have the same method of procuring salt which was common amongst the ancient Gauls and Germans; this was to pour gradually the salt water upon a wood fire" (Townson 1797, 395).

Prehistoric Archaeology of Salt

The research on the links between the prehistoric communities and the salt springs began as late as the 1960s. The first study in the Romanian literature concerned the archaeological discoveries from Solca (Suceava county), dating from the Neolithic (Starčevo-Criş culture) to the Middle Ages (Ursulescu 1977). The discovery of a Chalcolithic tell at Poduri (Bacău county) in an area rich in salt springs convinced a group of archaeologists to initiate research on the possible relations between these natural springs and the complex dwellings of the tell (Monah et al. 1980; 1991). The importance of the saliferous Moldavian sub-Carpathian area for the multiple development of the famous Cucuteni-Trypillia Chalcolithic complex was recognized by Linda Ellis (1984, 205). In a memorable statement she said: "It is also no accident that the longest area of occupation for the Cucuteni-Trypillia culture (i.e., the Eastern Carpathians and sub-Carpathians) happens to be a region noted for one of the largest salt formations in Eastern Europe. Exploitation of, control over, and trading of this essential resource no doubt contributed to the stability of Cucuteni-Trypillia village life in the face of cultural contact with Eastern steppe pastoralists, as well as enhancing the quality of food, storage, food consumption, and animal and human health." Notable is that the problematics of salt is also found in an ethnoarchaeological study: "One of the most interesting developments recently in Moldavian archaeology has been the emergence of evidence for sites functionally specialised in the exploitation of salt as far back as the early Neolithic; and a corresponding realisation of the importance of salt in the organisation of Cucuteni society" (Nandris 1987, 209).

This hypothesis was reconfirmed by subsequent discoveries in an impressive site of exploitation at the *Poiana Slatinei*-Lunca salt spring (Neamt county), where the prehistoric exploitation stratum, starting with the Starčevo-Criş culture, is up to 2.65 m thick (Dumitroaia 1987). The rate of such discoveries was intensified by subsequent finds, which led to the first synthetic archaeological studies about the exploitation of salt springs (Monah 1991; Ursulescu 1995; Weller 2000). Taking into account the fact that the archaeological data looked promising, mainly in regard to their antiquity, researchers in international programs came to study the problems of salt exploitation in Romania. Among these, we may mention the following: (1) three British-Romanian projects, *The prehistoric exploitation of salt in Transylvania*, from 2000 until the present, *Research on trade and exchange in the Cucuteni-Tripolye Network* from 2001 until 2005, and *Prehistoric salt exploitation in Romania and Anatolia* from 2002 until 2005, and (2) two French-Romanian projects: *Aux origines de la production du sel en Europe: préhistoire et écologie des Carpates Orientales*, from 2003 until 2004, and, from 2004 until 2016, *Les eaux salées*

de la Moldavie roumaine: archéologie, histoire et écologie d'une ressource structurante du territoire. The results of this complex research were emphasized in important studies focused especially on the archaeology of salt in Neolithic, Chalcolithic, and Bronze Age (e.g., Brigand and Weller 2018; Harding and Kavruk 2013).

Ethnoarchaeological Investigations on Salt

Many traditional applications are specific to the area where were identified the oldest traces of salt exploitation in Europe. This constitutes a great opportunity for new ethnoarchaeological research. This statement was recently made: Ethnoarchaeology becomes "a real science of reference for interpreting the past, if focused upon well-founded cross-cultural correlates, which link material culture with static and dynamic phenomena" (Roux 2007). As early as 1992, there was a focus on the importance of systematic ethnoarchaeological research on salt springs in the area under discussion, where there are also elements of continuity in the chrono-topical system. This study took into account over 30 salt springs from Neamt and Bacău counties, among others, which incorporated the idea of checking whether there were traces of exploitation from early archaeological times in their proximity (Alexianu et al. 1992, 160–161). We want to emphasize that this ethnological research was not conceived ab initio in terms of the site catchment area theory, but in the completely opposite perspective, namely, the importance of a salt spring for human communities: "We believe that the distribution scheme (of brine from the salt springs, A/N), of a radial nature, is likely, of course on other spatial proportions, to have also worked for habitations detected archaeologically" (Alexianu et al. 1992, 162). I cautiously assumed at that moment that the scheme was currently available to a distance of about 10 km.

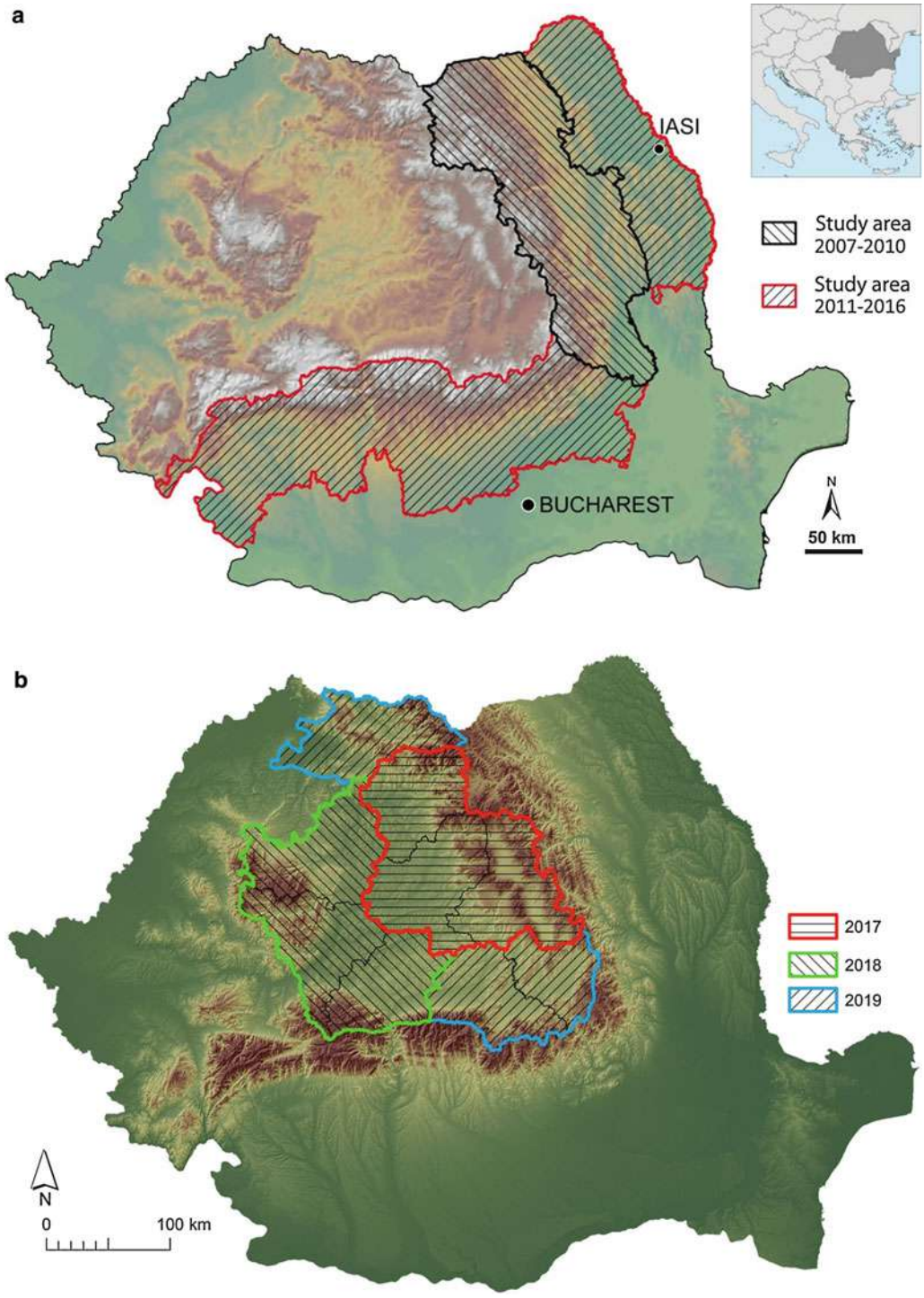
Addressing the ethnoarchaeology of the exploitation of salt sources in the resilient areas of Romania, I have concluded that we are in a privileged situation, of the second type of ethnographic analogy.

The ethnoarchaeological studies on this topic were additionally strengthened, thanks to three large research grants from the Romanian government through the National Research Council (CNCS), in particular, the projects *The salt springs of Moldavia*: *ethnoarchaeology of a polyvalent natural resource* (2007–2010), *The ethnoarchaeology of salt springs and salt mountains from the extra-Carpathian area of Romania* (2011–2016), and *The ethnoarchaeology of salt in the inner Carpathian areas of Romania* (2017–2019 — CNCS-UEFISCDI project PN-III-P4-ID-PCE-2016-0759, no 151/2017) all directed by M. Alexianu (Fig. 1a, b).

The main objectives of the Ethnoarchaeology of Salt project are:

1. To record the different human behaviors from the historical present concerning the salt resources
2. To identify on the ground the salt springs with archaeological evidence for the production of recrystallized salt in their proximity (Fig. 2)
3. To determine the non-industrial use of salt originating from salt springs and salt outcrops in the historical present (i.e., the past century)
4. To determine the distribution area of non-industrially exploited salt springs and salt outcrops
5. To model the distribution network of salt water (spatial information concerning the distribution of salt arising from salt springs and salt outcrops)
6. To critically apply an ethnographic analogy in order to explain the archaeological situations and phenomena related to salt

The first project benefited from a particularly useful tool, in the form of an original questionnaire (authors: O. Weller, M. Alexianu, L. Nuninger) that combined the traditional ethnographic approach with the archaeological perspective. The point of departure was the definition of a set of issues to be investigated, which, however, remained open to further clarifications and completions.



Ethnoarchaeology of Salt in Romania, Fig. 1 (**a**) Study areas of the first two projects on the ethnoarchaeology of salt in Romania. (Map by R. Brigand). (**b**) Study areas of the 2017–2019 ethnoarchaeological project on salt in Romania. (Map by R. Brigand)

Ethnoarchaeology of Salt in Romania, Fig. 2 Brine catchment systems. ((**a**–**d**) Moldova; photos by O. Weller; (**e**, **f**) East Transylvania; photos by V. Kavruk)

Ethnographic investigations of the salt springs have been conducted near the salt springs, at the seasonal animal-breeding settlements, and in the localities that exploit the salt springs. Generally, the salt springs are easily visible on the field from the various brine catchment systems, which are either open (Fig. 2a–d) or inside small wooden buildings (Fig. 2e–f). The oldest system is represented by tree-trunk segments carved on the inside (Rmn. *buduroi*), which protect the outlet of the spring (Fig. 2a). Analogies of this system have been recorded in France and dated to the twenty-third century BC (Dufraisse et al. 2004). The questionnaires address complex themes: the localization of the salt springs and the identification of the exploitation settings, transport, use, frequency, (re) distribution networks, trade and barter transactions, gifts, hunting, extracting methods, symbolism, ethnoscience, ethno-gastronomy, behavior, toponymy, and anthroponomy related to salt. Other specific methods comprise the geo-referential localization of the salt springs and global positioning systems (GPS); the spatial analysis method applied to the salt springs (habitat implementation relationship); an archaeological survey in the areas surrounding the salt springs, encompassing a range of 500 m around the salt springs; and the use of a chorographic method related to the concentration of the human habitation areas around the salt springs in archaeological and ethnographical time frames.

After the collection of over 500 completed questionnaires, the project found the results of around 20–25% of them to be entirely surprising. We discovered a genuine universe revolving around salt, one which archaeologists could have never imagined.

Different Ages of the Contemporary Informants and Different Diachronic Realities

Special consideration was given to the informants, who, unlike those from the so-called living societies, have lived in a Romanian societal context that has witnessed tremendous changes since the end of the nineteenth century. Accordingly, the informants contacted during the ethnological surveys were divided into three main categories.

The smallest one in terms of quantity, but the most valuable with respect to the information provided, is that of individuals aged over 70; they know *de visu* a variety of aspects related to the situation of the second half of the twentieth century. However, the most important information regarded the situations recorded during World War II and afterward. At that time, because the regular salt distribution commercial networks had been destroyed, and because of the great grain crisis of 1945–1946 in Romania, the traditional salt supply behaviors re-emerged and even intensified. People brought brine from springs, or they recrystallized salt by boiling brine. These phenomena were described by the informers as some kind of pattern with re-activating potential whenever the need arose, taking into account that some of our informers had personally used such subsistence strategies.

A second category is represented by adults aged 30–60, who know *de visu* the situation after the 1950s when, as has already been stated, salt spring exploitation activities were already established; it can be called a genuine "ethno-management." Incidentally, the informers also know indirectly (from the stories of relatives, friends, and acquaintances) relevant aspects for the period of the war and after it.

The last category – from children aged 5–6 to adults aged approximately 30 – is defined by the progressive knowledge of essential aspects related to the exploitation of brine from springs, mostly in the case of people actually involved in the process. However, no one who knew the situation from before the 1950s could be found.

All these rural inhabitants, and sometimes even the urban ones, are contemporary. But the elements of intangible cultural heritage that they possess sometimes has a considerable chronological stratification, in some cases going back a century. The parameters of the salt exploitation (spatial-temporal parameters of salt supplying, quantities, distances, uses, etc.) increase in number and magnitude as the informants' data concern older contexts.

Ethnoarchaeology of Salt in Romania, Fig. 3 (**a**) Salt vegetables, leaves, meat, and mushrooms. (**b**) Rock salt exploited for animal food. (Photos by O. Weller)

Pragmatic Uses of Salt

Ethnographic research has produced important insights regarding the use of natural brine and salt in general. There are more uses than has been generally considered by archaeologists. Firstly, we would like to emphasize the fact that salt water is still used in large proportions by adding it directly into different dishes and foods. Salt water is used both for family and collective (in some restaurants, monasteries, etc.) consumption.

For human consumption, salt water is generally used mostly for the conservation of bacon (Rmn. *slănină*) and pork, of various types of cheeses, and of various vegetables or greens (Fig. 3a). Important quantities (500–3000 l) are used by microenterprises, mostly by cheese factories which produce feta-type cheese (Rmn. *telemea*).

The salt boulders are licked by sheep and cattle (Fig. 3b). Salt water has a generalized use in different mixtures of food, particularly for pig fodder. Forage given to cattle is sprinkled with salt water.

Very rare were documented uses of salt in crafts. Even though now only sporadic, the use of natural brine for working sheep and cattle hides was generalized up until 2000. The natural brine is used by villagers for building fireplaces or ovens. One liter of brine added to 2–3 kg of clay renders it resistant to cracks at high temperatures, with the surfaces becoming vitrified and acquiring a whitish hue.

Some surprising results have been the use of salt water and salt as a remedy in various diseases. Peasants in the Moldavian sub-Carpathians use a wide variety of procedures using brine (e.g., mouth rinsing, inhallation of vapors, rubbing, etc.), some of which are rather singular in the European space (such as heating stones for salt water in the case of treatment of rheumatism in large wooden baths). Recent research has shown that a considerable part of halotherapeutic practices identified by ethnographic inquiries carried out in Moldavia are to be found in the Greek and Latin world. The common clinical specter of ancient and modern (but traditional) therapies includes gum and dental diseases, skin burns, headaches, angina, tonsillitis, boils, inflammations of the skin and dermatosis, kidney and stomach pains, lumbar and leg pains, joint pains, dog or cat bites, frostbite, mouth and ear diseases, and bleeding (Curcă 2007; Sandu et al. 2010). The existence of some common therapies in such different chronological and cultural spaces implies that salt has had a strong therapeutic dimension in prehistory, a reality commonly neglected by archaeologists. Recent ethnoarchaeological investigations in Transylvania (2018–2019), in the Inner-Carpathian area of Romania, have revealed the wide-scale ethno-treatment with salt mud (Rmn. *nămol sărat*) collected from the salt lakes or saltpans, in the latter case involving shallow excavation by hand (Fig. 4a, b). Salt-mud treatments in Transylvania were first mentioned 240 years ago (von Fichtel 1780).

Salt Boulders and the Control of Sheep Mobility

When the flocks go grazing in spring to the area found suitable by the shepherd, namely, to the *târla* (an unenclosed and open area where the sheep rest and sleep over night), the shepherd first places 6–7 rock-salt boulders in a semicircle at 10 m intervals. The sheep ascend to the area to freely lick the boulders, making a *târla*. They are then left in free stabulation, roaming the pastures, and after grazing they return on their own to the place with the boulders. When the shepherd wants to change the location of the *târla*, he moves the boulders to the new selected place. I have first recorded this grazing system in the summer of 2018 from the shepherds around Pata, near Cluj-Napoca (Transylvania), where recently there was discovered an archaeological site with wooden structures specific to the mining exploitation of salt deposits since the Bronze Age.

This is a textbook example of control, of manipulating the behavior of the sheep using salt. The ethnographic situation from Pata allows advancing the hypothesis that one of the ways by which sheep were domesticated involved the controlled consumption of salt in places specially selected by humans.

Hunting at Salt Springs

The salt springs and the proximate areas exert stable attraction for wild animals (particularly roe deer, red deer, and boars) and birds (doves, cranes, storks). The deer lick the dry and damp salted microzones. Boars bathe in the mud to protect against skin parasites. Similarly, storks are attracted to the area not by the salt, but by the micro-fauna living in the salt-mud microzones. Often, the frequent visits to the salt spring areas by some animals and birds raised the attention of hunters, who then improvise shelters for facilitating stalking there.

Symbolic Uses of Salt

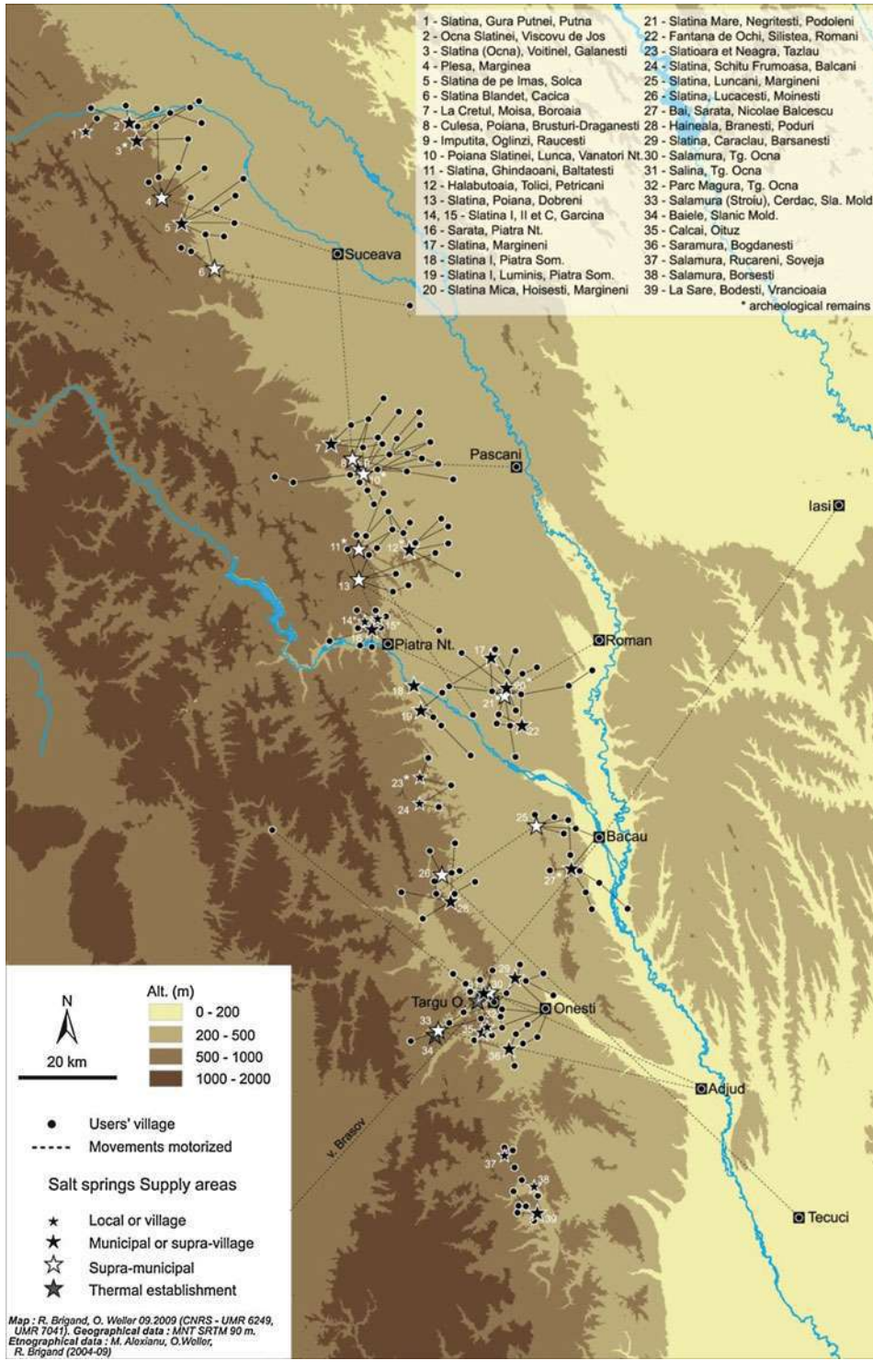
In the Romanian rural world, the informants of the first two categories showed equal and detailed knowledge of the symbolic uses of salt. There is a certain spatial variability and dynamic in the relationship between tradition and innovation. Because of its multiple symbolic valences, salt is part of all key moments of life in Romanian folk culture, and it has almost exclusively positive connotations. In many rural areas of Moldavia, when building a new house, salt, along with other elements (e.g., grains, bread, incense, coins, holy water, or basil), is placed in the eastern corner or in all four corners or in small holes made in all four corners of the house. In these situations, salt symbolizes "peace and prosperity." The importance of these practices is crucial for reopening the discussion on the well-known European Chalcolithic foundation rites where salt – by its nature – is condemned to being an "invisible element" (Alexianu et al.

Ethnoarchaeology of Salt in Romania, Fig. 4 (**a**) Ethno-treatment with salt mud at the Aluna (or Puturoasa) Lake near Târnăveni-Transylvania. (**b**) Salt mud collected by a villager from Gădălin (Cluj county). (Photos by St. Caliniuc)

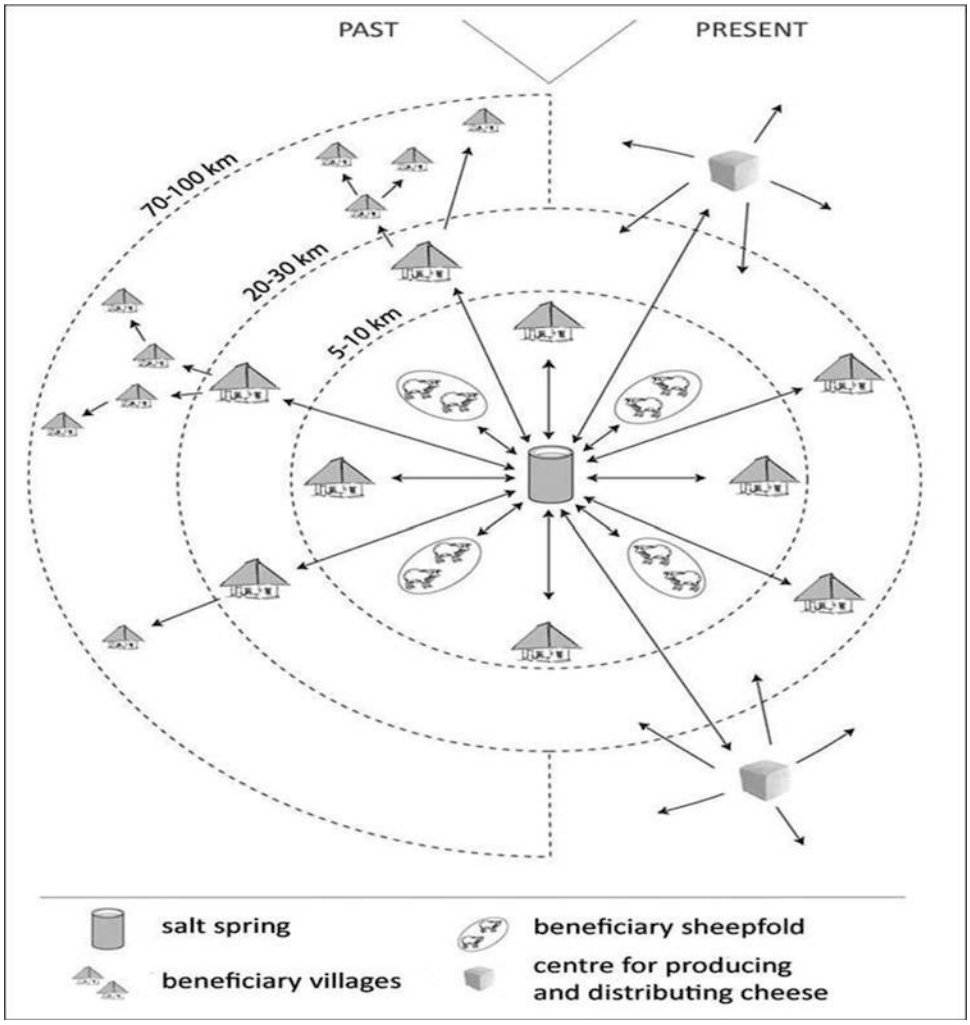
2007). Furthermore, salt is put under the doormat of the house "to chase all evil away." When a newborn is left in a room, salt is put on the window sill to scare the devil away. Salt is used during various phases of the wedding ceremony, symbolizing richness and wealth, harmony between spouses, and "the good luck of the house." When a housewarming ceremony takes place, the friends of the owner must bring salt and bread, which symbolize abundance and prosperity; a lack of salt in the house means poverty. A surprising element is salt symbolism for predicting the gender of the future child: "somebody puts some salt on the top of the head of a pregnant woman, without her knowledge. If she puts her hand to her mouth, it is a girl, and if she puts her hand elsewhere, it is a boy."

Salt Springs and Settlements

One of the important accomplishments of the first two projects was the achievement of an original classification of settlements according to salt springs (Alexianu et al. 2012) (Figs. 5 and 6). They vary according to the main forms of exploitation:



Ethnoarchaeology of Salt in Romania, Fig. 5 Use and supply areas of salt springs. (Map by R. Brigand, M.A. Alexianu, and O. Weller)



Ethnoarchaeology of Salt in Romania, Fig. 6 Modelization of the historical and current data on supplying with brine. (R. Brigand, M. Alexianu, O. Weller)

1. Collection, transport, and uses of salt water as such
2. Collection, transport, and thermal treatment of salt water to obtain crystallized salt and uses
3. Collection, transport, and use of naturally crystallized salt around the salt spring

Saltwater Supply

Our classification consists of:

1. Saltwater supply point which practically corresponds with the area in direct proximity of a salt spring: supply is short-term and depends on the total capacity of recipients used for transportation, on the flow of salt spring, on the volume of salt spring catchment, and on the number of persons involved in taking out salt water and pouring it into the receptacles for transportation. It is a human activity which does not generate or leave traces, with the exception of some sherds from accidentally broken recipients (or now plastic bottles). In this category, there are salt springs where sporadically fragments of archaeological ceramics have been found on the surface from one or several periods. This area is not actually inhabited; it is only occasionally visited.

2. Dwellings/settlements which are supplied directly from a salt spring:

2.a. Seasonal dwellings of the sheepfold (Rmn. *stână*) type; the salt spring is sometimes used to prepare sweet cheese, only as a foodstuff for shepherds; especially savory are the pieces of sweet sheep cheese (Rmn. *cas*, from Lat. *caseus*) dipped in salt water for a short time before they are consumed. Identification of seasonal locations of this type when archaeological research takes place most certainly represents a very difficult task, but archaeologists must be warned about the possibility of the existence of such locations. Some agglomerations of ceramic fragments identical to those by a salt spring, situated at a distance of about 1 km from a spring, could indicate this kind of seasonal settlement for ovines and bovines. It is possible to demonstrate that areas near salt springs are frequented by sheep or cattle herds, as is often the case today, through paleoenvironmental analyses. For example, at the Hălăbutoaia salt spring, Tolici-Neamt, non-polinic microfossils (coprophilous mushroom spores) showed the existence of pastoral activities synchronous with a Neolithic salt exploitation (Danu et al. 2010); the same could be noticed in the case of the salt spring at Poiana Slatinei (Lunca, Neamt), where the choice of fuels used for the exploitation of salt in the early Neolithic seems to be complementary to animal feeding (Dufraisse et al. 2010).

2.b. The settlements as such; ethnographic inquiries have noted that all villages around a spring use salt water. Two distinct situations could be identified.

(1) With a single salt spring in a given area or with a salt spring of superior taste qualities, great flow, and easy access in an area with several salt springs. Usually, saltwater supply today is carried out from settlements situated at a distance of about 10–15 km from the respective spring; distances may reach 25–30 km (Alexianu et al. 2007, 144).
(2) When there are several salt springs of similar taste, flow, and access possibilities, situated at a distance of 5–6 km between each other, each of them is used in groups of two to three villages situated at a distance of two to three kilometers from the spring (Monah 1991). In this case the distance of supply from each spring decreases, but the supply area has parameters comparable with the previous situation.

3. Settlements supplied indirectly with salt water, located between 40 to 50 and approximately 100 km from a salt spring. The distribution direction is from direct users to settlements located in remote areas. Accordingly to inquiries carried out so far, saltwater transport to settlements which are located so far away is more rarely attested; only in exceptional cases (the end of World War II and the following years), was salt water transported from the salt spring alongside recrystallized salt, in the same wagon.

To conclude, use of salt water involves only the act of supply and generated a distribution network, more rarely a redistribution network. Today saltwater supply is practiced on a relatively large scale and does not represent an indicator of poverty: it is used by different categories of economic and social status, mostly due to the quality of vegetable, cheese product, and bacon conservation. With cheese conservation, even some (feta) cheese (Rmn. *telemea*) micro-production units use water from salt springs intensively.

Production and Supply of Ignigenous (Direct Heat-Evaporated) Salt

Before the modern production of crystallized salt (*huscă*), it is advisable to underline the very probable chronological continuity of the choices which led to salt exploitation of one spring rather than another one. Indeed, salt springs with archaeological evidence for the Neolithic and the Chalcolithic exploitation are systematically an important water flow (or a well with a big capacity) and a very high salinity. It is for these same reasons that these springs were, even recently, exploited for crystallized salt.

The practice used for recrystallization of salt by boiling natural brine, which usually ceased around the middle of the 1990s, involved the following three main strategies: (1) production of recrystallized salt (popularly known as *huscă*) in the proximity of the salt spring; (2) production

of *huscă* in seasonal habitats such as isolated sheepfold in the mountains (Rmn. *stână*); and (3) production of *huscă* in villages (in the courtyard or more rarely inside the houses). A cauldron on a support, sometimes suspended, was used for the brine evaporation.

The following three stages in the use of recrystallized salt from salt springs can be listed mostly in the northern half of the area investigated: (1) saltwater supply, (2) production of recrystallized salt, and (3) its (re)distribution.

The relationship between human communities and the salt spring becomes more complex. We can distinguish the following situations:

(1) Salt spring – point of saltwater supply; the salt water was transported across very short or long distances. Ethnographic inquiries have shown that water taken from the spring was boiled either in the immediate proximity of the salt spring or at a short distance (30–50 m), or in seasonal dwellings such as *stână*, or in villages situated at a distance of 5–7 km from the salt spring.

(2) Point of production of recrystallized salt by boiling natural brine, located near a salt spring, generally upstream, with a seasonal character. More information has been obtained about this kind of production. This is a significant fact. The duration of the stay of a person or persons who produced *huscă* varied according to several factors (distance, accessibility, and others). Most significantly it depended on the quantity of recrystallized salt which was supposed to be obtained. The most common duration of stay took place in daylight. Otherwise, peasants might have stayed for 2–3 days, with a plan for each partner to obtain about 100 kilos of *huscă*, considering the fact that complete recrystallization of brine (Rmn. *slatină*, *saramură*) in a cauldron needed 6 to 7 hours of boiling. In one recorded instance, a family stayed to obtain *huscă* for 2 to 3 weeks, living in an improvised seasonal dwelling in the vicinity of the salt spring.

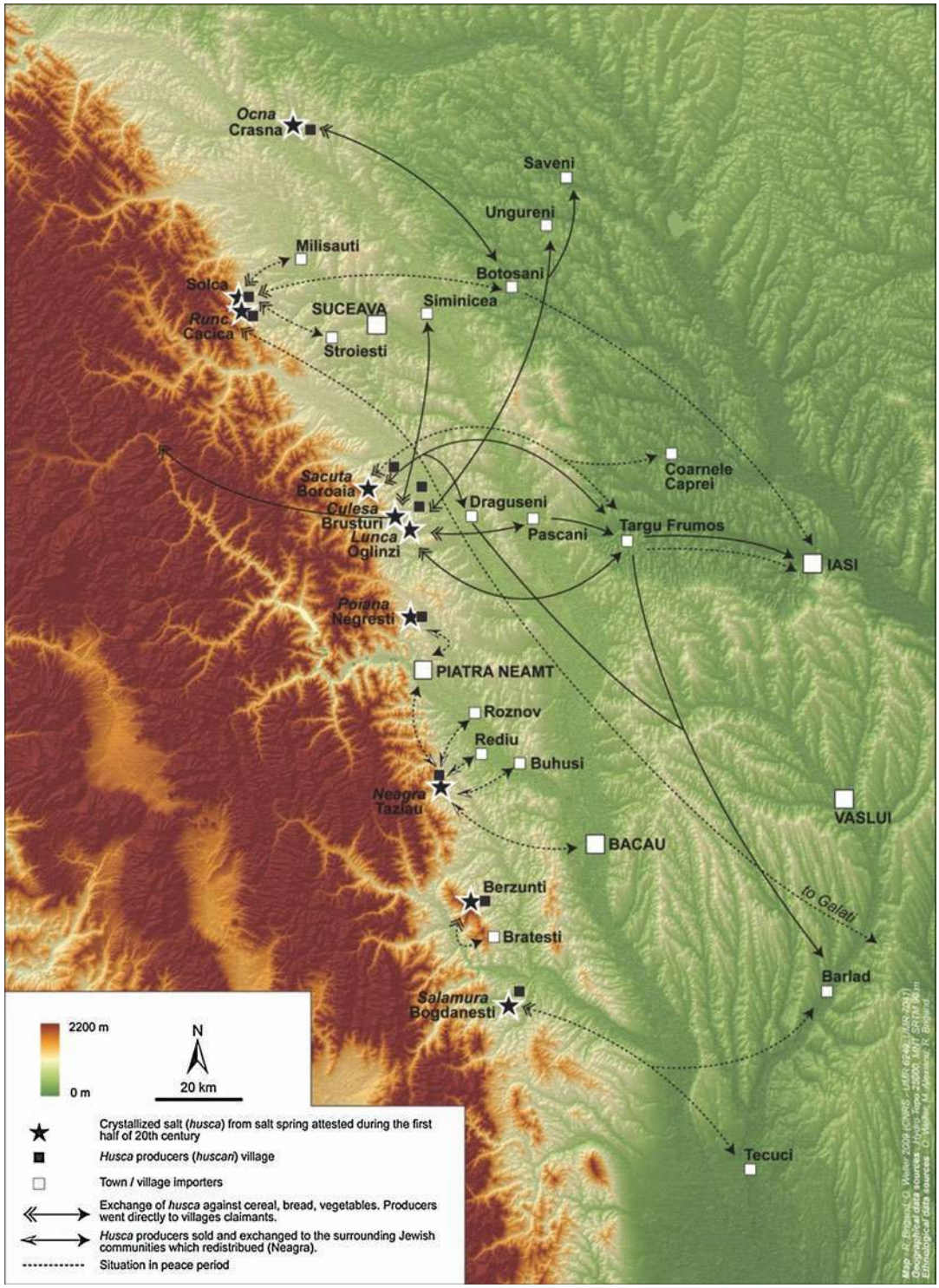
With respect to the number of people involved in the production of *huscă* in the proximity of the salt spring, it depends on the distance at which the user settlement is located. If the village was located relatively close to the spring, two to three people have been attested, as in Rucăreni-Soveja, as involved in the production of *huscă* at the spring. With localities farther from the spring, groups of producers of *huscă* have been found to be more numerous, as in the salt spring (Rmn. *slatină*) of Râsca, which shows concern over the economic profitability. But the existence of several *huscă*-producing groups at Neagra shows a constant micro-production carried out in the interwar period by the villagers of Tazlău located close to the respective spring, for trade reasons and selling in some villages and towns in Neamt and Bacău counties. In the case of the same spring, inquiries have shown that *huscă* was produced both close to the spring and in the villages. *Huscă* producers are aware of the advantages and disadvantages of each production locality. With *huscă* production at the spring located at a more remote distance from the user settlement, the advantages involved the presence of fuel in that precise place and the transport of a larger quantity of recrystallized salt; the disadvantage consisted of a longer stay, difficulties in supply, and diseases generated by the low comfort of seasonal settlements. When *huscă* was produced in the user localities, the advantage was that comfort specific to stable settlements could be organized, while the disadvantage lay in the transport of larger quantities of salt water and in the additional effort for fuel transportation.

The *huscă* was mainly destined to be bartered or sold in localities within a distance of 20–30 km or at 70–200 km (Figs. 7 and 8).

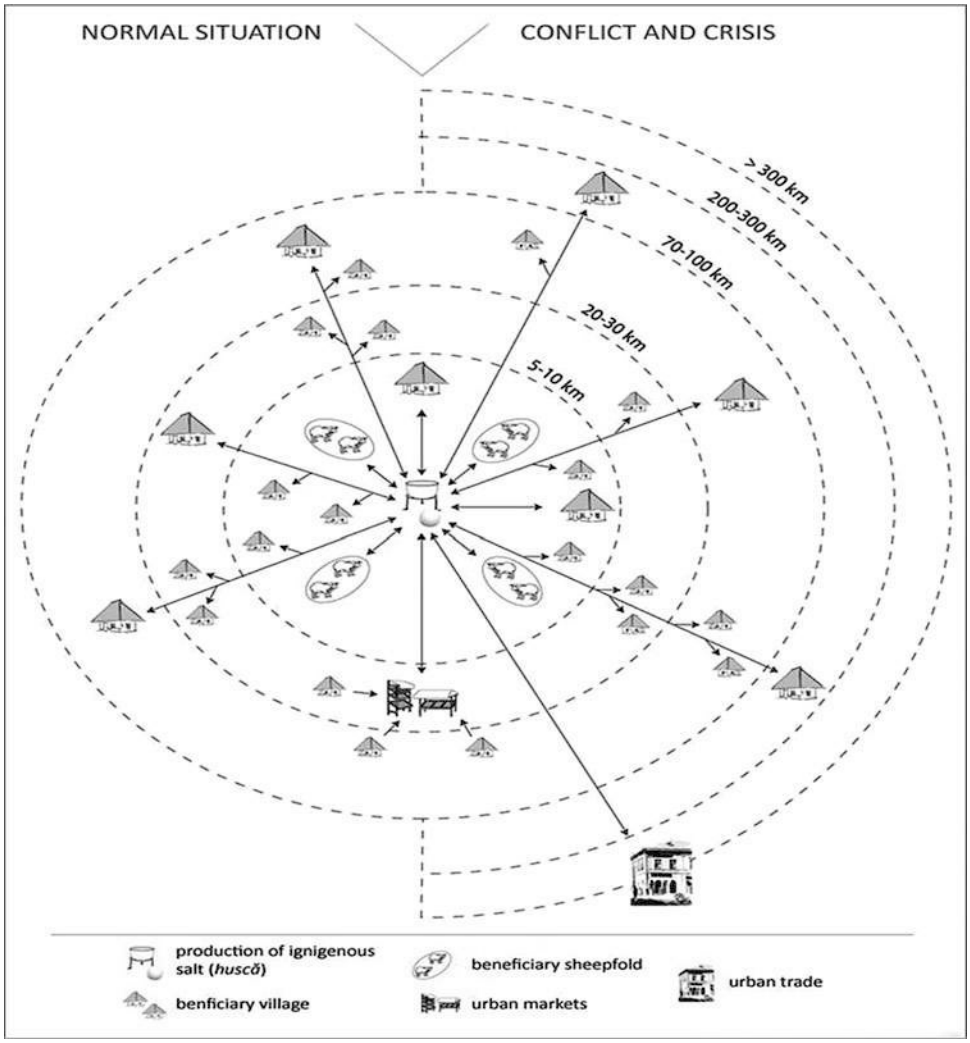
(3) Point of recrystallized salt production by a seasonal settlement *stână* (sheepfold) type: the salt is used exclusively for the local needs, mostly for sheep.

(4) Point of production of recrystallized salt in a settlement, as follows: (a) the salt is destined exclusively for the household needs; (b) the salt is destined for partial household needs; and (c) the salt is destined partially for barter or sale in localities situated within up to 20–30 km or localities at a distance of 70–200 km.

Generally, we can conclude that the distribution territories of recrystallized salt (Fig. 7) are considerably larger than those of saltwater distribution, as a rule, up to 80–100 km; but inquiries



Ethnoarchaeology of Salt in Romania, Fig. 7 Salt crystallized production and barter during peace and war periods in the twentieth century. (Map by R. Brigand)



Ethnoarchaeology of Salt in Romania, Fig. 8 Model for supplying with crystallized salt during normal times and periods of crisis. (R. Brigand, M. Alexianu, O. Weller)

conducted in 2009 have shown longer routes of approximately 300 km (e.g., Suceava-Galati).

As to the distribution of *huscă* for various exchange or sales, there are two situations depending on the permanent or sporadic character of *huscă* production.

In the first case, under normal (until WW2), when *huscă* is produced constantly, it was transported with a relatively regular frequency at short distances of 15–40 km. So, inhabitants of Poiana-Negresti who produced *huscă* would go to exchange "salt-clods" (Rmn. *boturi*/*bulgări de huscă*) with the Jewish merchants in the *Strada Mare* (i.e., the main street) in Piatra Neamt. In exchange they would get olives, fish, carobs, or peasant sandals (Rmn. *opinci*). *Huscă* was also sold directly in the market in Piatra Neamt. Producers of *huscă* in Poiana-Negresti would exchange cereals at the commission of settlers in neighboring villages. As a rule, producers of *huscă* would transport it themselves and carry out the transactions. Specialized producers were both transporters and business people, a circumstance which contributed to increasing their profit. In one case *huscă*, this time as powder, obtained in the vicinity of *slatina* in Neagra and Slătioara (Tazlău)

was usually sold; it was also bartered for oil with Jewish merchants in Piatra Neamt, Buhuşi, and Bacău towns and in the villages of Rožnov and Rediu, which in their turn would trade them.

In the second case, under exceptional conditions, such as the disorganization of supply with common salt at the end of World War II or during the drought in 1945–1946, we witness an intensification of recrystallized salt production and a considerable extension of the distributional areal up to 100 km and even as far as 300 km. Fortunately, we were able to obtain information about the quantitative aspects of the barter. So, one kilo of *huscă* could be bartered for 2–3 kg of wheat or 4–5 kg of corn. But the circuit did not stop here at all, as sometimes a part of the quantity of wheat obtained in this way was sold in mountain areas in Valea Bistritei, where cultivation of cereals was almost impossible. In fact, the need for wheat and maize was satisfied by the exploitation of free natural resources, which also brought in the money necessary for other needs. We should underline the fact that the carts transported brine in barrels of a total capacity of 1000 or even 2000 l.

The inquiries brought evidence of a similar model in several locations in the Moldavian sub-Carpathians. The barter with *huscă* had stopped in 1946 during the great famine, as, on the one hand, there were no cereals for barter and, on the other, the import from USSR of reddish common salt cake (5 kg) began. Even the transport by train of small quantities of *huscă* (approximately 20 kg), for very long distances during the drought, in order to solve by barter the needs of wheat and maize at the level of one family, has a certain relevance for archaeological time; an illustrative example in this respect can be the transport from Cucuieţi-Solonţ (via the railway station in Moineşti, Bacău, Eastern Romania) to the Banat (Southwestern Romania) or from Solca in the north down to Constanta in the southeast (Black Sea coast).

Use of Naturally Recrystallized Salt

During the last period of ethnographic inquiries, another salt exploitation technique was brought to light: the "harvesting" of naturally recrystallized salt around and downstream salt springs and its use as such in human and animal food, conservation, etc. Even though the last century has not been in any way significant, this type of exploitation is extremely suggestive for the understanding of prehistoric situations. Our hypothesis is that prehistoric man first exploited salt water, and only later naturally recrystallized salt, in the proximity of salt springs. Naturally recrystallized salt offered a model for obtaining large quantities of salt by natural (solar) or artificial evaporation, by boiling. In other words, the ignigenous process of obtaining salt results from the natural process of evaporation without any human intervention.

Generalizing, the ethnographic database on *huscă*-cereal exchange indicates that the crystallized salt production in the sub-Carpathian area of Moldova used to meet the salt needs of communities in the territories located to the east of the Carpathians up to the present frontier of Romania. The *huscă* supply model at such a large distance has important interpretive implications for prehistoric times. This model supports, albeit only partially, the hypothesis that part of the crystallized salt production was destined to long-distance exchange (Monah 1991), especially if this salt was made in the form of tough, compact blocks which were easy to carry, as suggested by the appearance of briquettes in the Cucuteni culture (Weller 2002).

Archaeological Experiments

In the historical present, salt recrystallization by boiling brine has generally been made using metallic recipients, either inside the house (in cauldrons of up to 5 l) or outside (in cauldrons between 30 and 50 l). In the eastern part of Romania, so far there have been found 21 sites near salt springs with briquetage fragments. In this respect, in order to better understand the process of obtaining salt cakes using briquetage, we resorted to experimental archaeology. Up to that moment, no complete briquetage had ever been discovered, and all previous experiments to produce tronconical salt cakes had failed. The approach was based on the existing

archaeological data – descriptions of briquetage sherds and their discovery contexts – as well as on ethnoarchaeological accounts and previous experimentations. The experiments, initiated and conducted by project member Felix-Adrian Tencariu, allowed some valuable observations on the distinct aspects of this *chaîne opératoire*: modelling and firing the briquetage vessels; exposure to fire of the recipients filled with brine or a salt slurry of varied concentrations; the amount of time needed for crystallization and hardening of the salt, dependent on the fuels used and temperatures reached; ways of extracting the salt cakes from the ceramic coat; and assessment of the effort (i.e., labor and raw materials) involved by the whole process. All the failures, challenges, and eventual successes encountered during the experiments granted an insight into an ancient technique, described mainly a priori in the archaeological literature (Fig. 9). Also, it gives a hint in understanding the appreciable importance and value of salt in times when this essential mineral was not available as it is today.

What is notable is that this was the first such experiment to successfully obtain unfragmented salt cakes after breaking the briquetage. Previous attempts failed foremost because the recrystallized salt adhered to the ceramic walls. This was mitigated by covering the walls with burdock leaves, thus separating the wet salt paste from the pot (Tencariu et al. 2015).

The Exploitation of Salt Outcrops

Methodological Aspects

Immediately after the EthnosalRo project commenced, M. Alexianu elaborated a new questionnaire concerning the salt outcrops. The main themes concern the identification of the salt outcrops in the studied microzone, including microtoponymic aspects; the harvesting of the salt (extraction periods and parameters, tools employed); spatial analysis (the settlements and sheepfolds supplied, the time required for reaching the salt outcrop on foot or by various transportations means); transportation (transportations means, packaging); uses – human consumption (private, collective, commercial), animal feeding, preservation (cheese, meat and fat, vegetables), halotherapy, etc.; the ratio between the use of rock salt, natural brine from salt springs, and artificial brine (obtained by dissolving rock salt into the water); the attraction exerted by the salt outcrop on wild animals and hunting; frequency of salt supplying; trade and barter; behaviors/ethnoscience; and symbolism of salt.

In order to understand more thoroughly the role of salt in animal husbandry, it is necessary to turn to the ethnological research into this issue. The pastoralism practiced nowadays in the area is sedentary (or so-called village pastoralism), which involves the movements of animals for grazing at a few days distance from the human settlement. In the cold season, the flocks are kept in the village.

Among all salt outcrops investigated, the area around the Alghianu creek provided particularly complete information (Alexianu et al. 2015). With respect to the exploitation of salt from Alghianu, it should obviously be ascribed to a phase preceding the actual mining exploitation, respectively the quarrying of rock salt (Harding 2013, 34, 61). Even if it constitutes quarrying, this type of exploitation of the rock salt during prehistoric times required, as evinced from our investigations, particularly hard tools (at least axes, chisels, and hammers fashioned from stone or metal). From another point of view, this type of exploitation of rock salt involves a variety of activities (extracting, transporting, and crushing the salt) much more labor-intensive than those of the exploitation of the salt springs. The ethnographic investigations have nonetheless revealed that this activity is not too complex for the shepherds, who become quarry-miners for 1 or 2 days each year. The existence in the area of the Alghianu outcrop of rural communities with quasi-autarchic economies centered on animal husbandry (cattle, ovicaprids, swine) allowed us to highlight the role held by salt in animal feeding (Fig. 10). The herdsmen provided precious information regarding the quantities of salt needed for cattle and sheep. Thus, a cow needs around 20–30 kg of salt per year, while a sheep consumes approx. 1.5 kg of salt per year. Both species consume

Ethnoarchaeology of Salt in Romania, Fig. 9 The experiment on briquetage and salt production. Preparing the insulating layer, filling the recipients, breaking the ceramic recipient, and the resulting complete salt cake. (Photos by F. A. Tencariu)

more salt in wintertime than during the warm season. The consumption of salt by the animals increases the quantity and the quality of the milk. With respect to the precise quantities consumed, the numbers provided by the herdsmen should be taken with a grain of salt, since they are approximations.

The transport of the salt to the consumer settlement is usually done with the wagon. Conversely, transport from the consumer settlement to the consumer sheepfold is done either with the horse or with the wagon, according to the difficulty of reaching the sheepfold. We can conclude that the supplying with salt of the flocks is one of the mandatory conditions for transhumance. As the quantity of available salt to a certain number of sheep increases, so does the mobile pastoralism extends to greater distances and for longer periods of time, with increased yield of milk and a better general health of the animals.

Ethnoarchaeology of Salt in Romania, Fig. 10 Field images of the ethnoarchaeological campaigns conducted in the microzone of the Alghianu salt outcrop. (Photos by A. Asăndulesei and F.-A. Tencariu)

In this context, it was possible to develop new models of salt supplying of the settlements and sheepfolds from this area witnessing intensive animal husbandry: (1) supplying with salt boulders strictly for the needs of the inhabitants and the animals from private homesteads (for human and animal consumption, for preserving foods and fodder); (2) supplying with salt boulders of the settlements in the sense of point 1, to which is added the supplying for sheepfolds located within the boundaries of the settlements; (3) supplying with salt boulders for the settlements in the sense of point 1, to which is added the supplying for isolated sheepfolds located in mountainous areas; and (4) direct supplying with salt boulders for the sheepfolds located in

mountainous areas (when they have exhausted the initial salt reserves), as well as of the sheepfolds found near the salt outcrop.

Archaeological Experiments

The Inner-Carpathian regions of the present-day Romania and Ukraine witnessed the discovery in salt production contexts of troughs made of hollowed out tree trunks dating from the Middle and Late Bronze Age (ca. 1600–800 BC). The troughs were perforated along the median line of their bases by several orifices with the longitudinally perforated pegs inserted in them. Sometimes, wooden nails and/or twisted cords were found inserted in the pegs' orifices. Most scholars consider troughs as the devices used for drilling the extremely hard rock salt, while others tend to favor their use in the increasing salinity of brine. Since this was not attested by the investigations carried out in our project, for a more thorough understanding of this system, our colleagues D. Buzea and V. Kavruk resorted to archaeological experimenting. The experiments, which involved replicas of various types of troughs, concerned both the drilling of the rock salt with jets of fresh water and various methods of increasing the salinity of salty mud and brine (Fig. 11).

The decisive role in the interpretation of the troughs must play into further research of the archaeological contexts and the taphonomy of the sites (Kavruk 2018).

The Radial Model of Salt Supply

The study of maps (Alexianu et al. 2011, Fig. 2) reveals a variety of situations; thus, the area of distribution of salt springs occupies fractions of a circle, semicircle, or more, while the area of distribution of other springs (less numerous) shows a completely radial aspect (Fig. 12). In fact, the complete radial aspect represents the reference model; other sub-models are due to the absence of human communities in certain areas (usually mountain areas not adequate for human settlements).

The EthnosalRo ethnological research project on the distribution of salt boulders from salt outcrops points to the same complete radial distribution model (Alexianu et al. 2015).

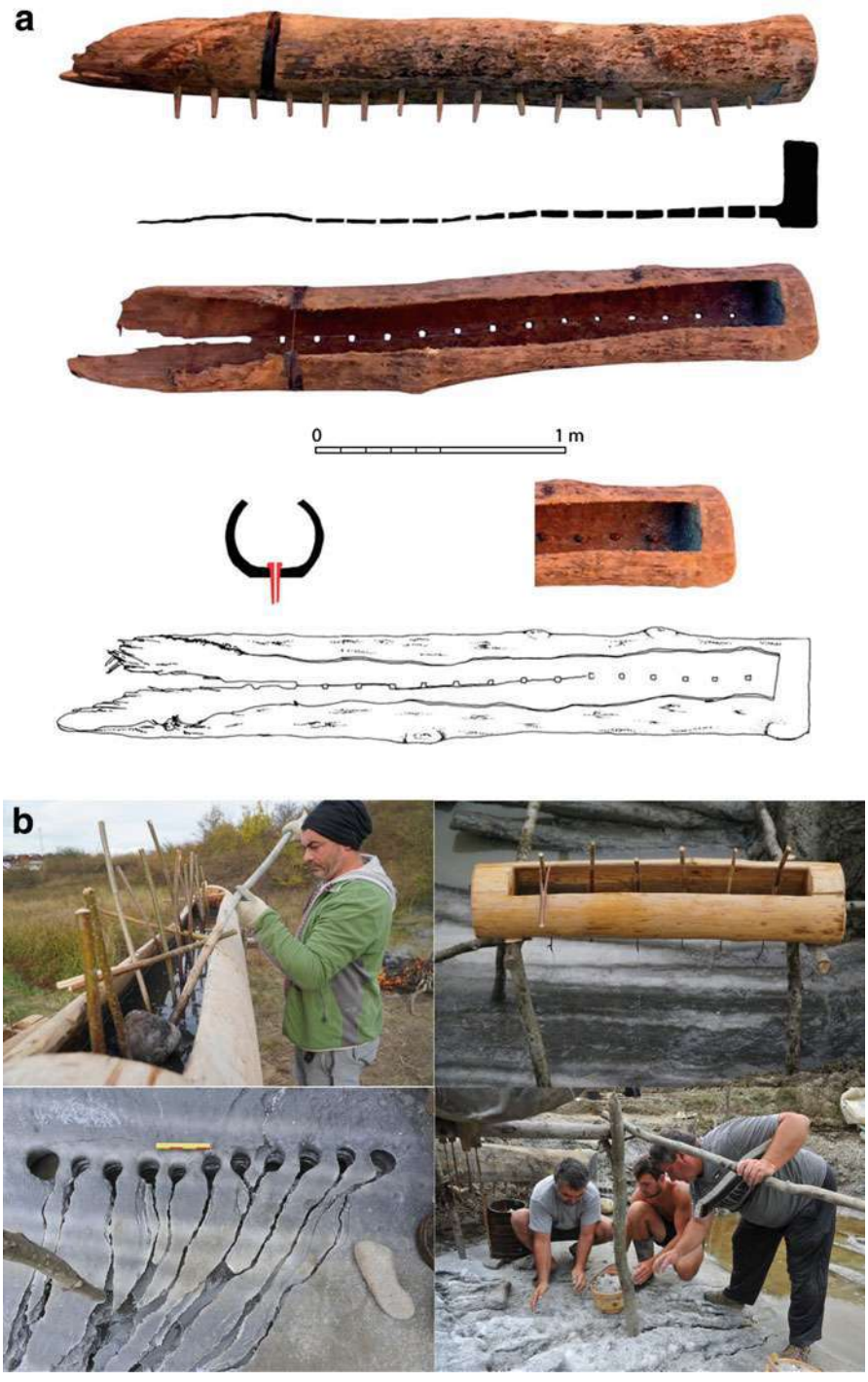
Very significant is the situation of the Alghianu deposit which, in a first phase, presented a semi-radial distribution model, and in a second phase, determined by the ceasing of the exploitation of another nearby salt deposit, the distribution model of salt boulders from Alghianu becomes complete.

Another situation when the distribution model is always semi-radial is that when the distribution of salt boulders accompanies shepherding movements toward sheepfolds situated far away, in which case the distribution is necessarily from the villages to the mountainous areas, i.e., from the east to west.

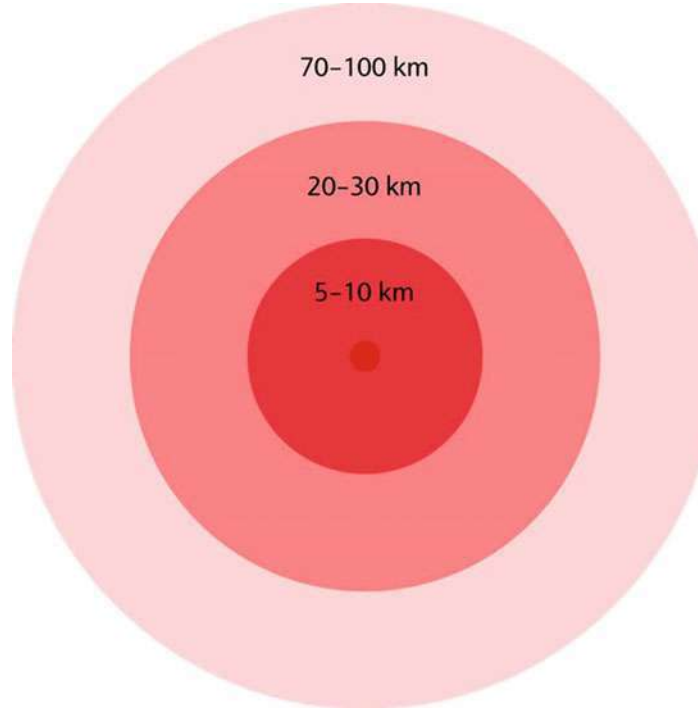
Regarding the distances for which the radial model of brine from salt spring distribution is observable, ethnological research revealed that, in recent years, they usually vary from a few kilometers to a maximum of 30 km, while, at the end of and right after World War II, they could reach up to 100 km. In the case of the distribution of ignigenous salt obtained from salt spring brine, the distances reach up to 300 km and more.

Depending on several important factors cumulatively – discharge, salinity, and taste – the area of attractiveness of saltwater springs varies from a strictly local level (1–3 villages) to a microzonal level (villages located up to 30 km away). The area of direct attractiveness of saltwater springs has to be differentiated from the area of distribution of salt water, which, in exceptional circumstances (war, drought), can reach approx. 100 km and, in the case of ignigenous salt, up to 300 km and more (regional level).

Regarding the direction of movement for the supply of salt water, at the local level, it is done from the human settlements to the spring, while at a regional level, we can speak of a two-way direction, the initial movement from the settlement (located a few kilometers from the spring) to the source and the subsequent movement from the spring to the carrier's village and from here to the supplied localities situated at distances up to 100 km.



Ethnoarchaeology of Salt in Romania, Fig. 11 (**a**) The first trough discovered at Băile Figa. (After Harding and Kavruk 2013). (**b**) The "trough technique" experiment. (Photos by D. Buzea)

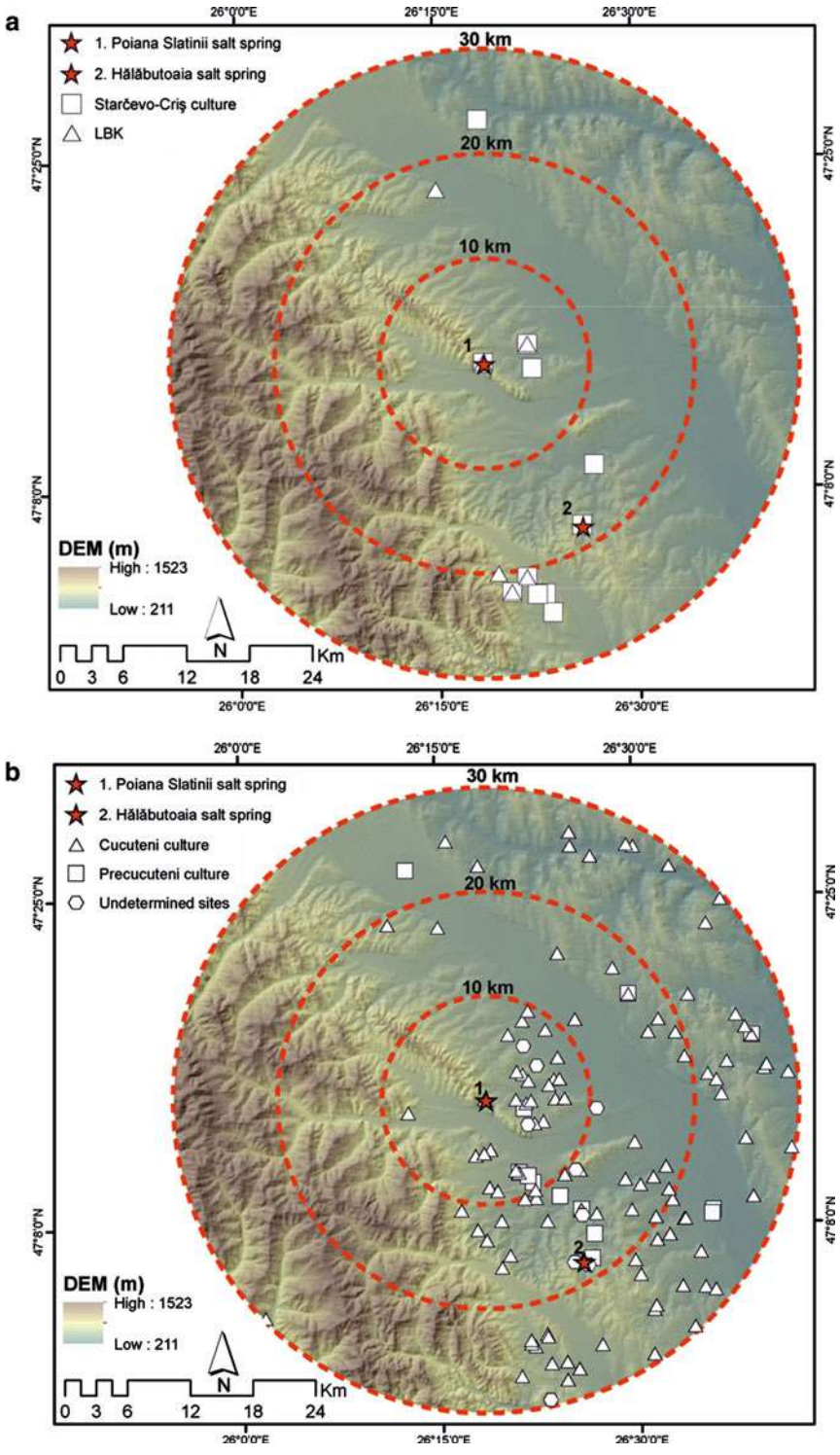


Ethnoarchaeology of Salt in Romania, Fig. 12 Areas of supplying with brine from one salt spring: direct supplying up to 20–30 km and indirect supplying to 70–100 km. Supplying frequency: frequent (darker shades) to once or twice a year (lighter shades)

In conclusion, based on the over 500 ethnological investigations carried out so far within the framework of two extensive projects on the salt springs and salt deposits from Romania, we were able to build a radial supply model for brine from salt springs, ignigenous salt obtained from salt spring brine, and salt boulders from salt outcrops (Alexianu 2015). The complete radial model is available when all around the salt spring or the salt deposit, there are human settlements. We can speak of an incomplete radial model where human settlements (permanent and seasonal) are located only in certain areas compared to a salt spring or a salt deposit.

The ethnoarchaeological approach must be considered to be completed only in cases where ethnographic knowledge and/or models have been applied to different artifacts and/or situations in the archaeological past. Here we present the current radial supply model with brine from two important salt springs (Weller et al. 2008; Dumitroaia et al. 2008) in the Moldavian Subcarpathians (Romania) applied to the Neolithic and Chalcolithic periods (Fig. 13).

The analysis of the generated imagery and the statistical data in the tables offer the first clues regarding the habitation model of the Neolithic and Chalcolithic communities all around Lunca-*Poiana Slatinei* and Tolici-*Hălăbutoaia* salt exploitation key points (Asăndulesei et al. 2014). As a preliminary conclusion expressed in relative terms, it can be said that the closer a site is to a major salt spring, the more the salt (brine) factor establishes itself as relevant for the settling selection process. As the distance from such a salt spring increases, other factors gradually take precedence. The results offer a sufficiently detailed image of the constant interactions between the first prehistoric human communities and their surrounding environment, underlying, alongside the other variables specified, the importance of the salt resources for the prehistoric human communities living in the piedmont areas of the Eastern Carpathians. The maps above present synchronic representations for the Neolithic and Chalcolithic settlements, with the diachronic dimension only partially discernible. But, as the simple comparison of the two maps shows, the role of the salt springs in increasing the density of the human occupation is substantially incontestable. In a temperate continental area as Romania, salt has



Ethnoarchaeology of Salt in Romania, Fig. 13 (**a**) Salt springs and first Neolithic settlements. (Map by A. Asandulesei). (**b**) Salt springs and chalcolithic settlements. (Map by A. Asandulesei)

always played a crucial role in preserving food (meat, bacon, cheese, vegetables, etc.) for use during the unproductive seasons. Thus, it is thus entirely appropriate to define the salt springs as salt attractors for human communities. This capacity as attractors seen in the archaeological time is a substantive argument for their role as key factors in the process of sedentarization. The problem of meeting the nutritional requirements for the human groups engaged in mobile hunting throughout the year – and critically in wintertime – was alleviated by using brine for preserving the meat.

This methodological approach requires amendments (e.g., a digital elevation model with a higher resolution), additions, and calibration, but it establishes itself as a starting point for future similar research in this area and, moreover, can serve as the basis of a predictive model suitable to be applied to other similar chronological or geographical settings.

International Perspectives

This current 12-year project provides a solid reference and unique approach keys for understanding the exploitation of salt in the archaeological past and, in a broader sense, for understanding the impact of salt on pre- and proto-historical societies. Ethnographic models on the exploitation of salt springs and salt deposits open the way for new interpretative hypotheses on many inland European and global reference sites. At the same time, the research models proposed by this project itself can be tested at other interior continental areas worldwide where there are archaeological traces but the exploitation of salt has not survived.

Future Directions

Given the complexity of the research carried out within this project, many aspects have only been tangential or insufficiently studied. Therefore, it is necessary to expand the research on at least the following topics:

- Experimental archaeology of salt exploitation; the future experiments will focus on the production of on-site structures, installations, and tools related to the exploitation of salt, similar to those found in archaeological deposits, and testing their functionality.
- Spatial analysis method applied to the salt resources-habitat implementation relationship.
- Systematic research of numerous halotherapeutic practices at local and global level in order to highlight the medical dimension of salt for the prehistoric archaeological sequences.
- Implications of studying the intangible heritage of salt on archaeological research.
- Testing the ethnoarchaeological models produced by this type of projects, in areas rich in salt from across the world, with archaeological evidence but no surviving practices of exploiting the brine or the salt outcrops.

Conclusions

The resilient areas of Romania have the highest potential in Europe for ethnoarchaeological research on the preindustrial civilization of salt. The area harbors some of the most representative European archaeological sites related to the continuous exploitation of salt spring brine and rock salt from 6050 BC until present. Of major ethnoarchaeological relevance is that villagers and even some city-dwellers maintain to this day traditional behaviors related to the exploitation of salt springs and salt outcrops.

The EthnosalRo project series has produced a complete ethnoarchaeological referential on salt, which meets the exigencies of a saturated model (Alexianu 2013). In terms both of the consistent methodology and of the area with salt resources present and covered, this project constitutes a one-of-a-kind ethnoarchaeological research endeavor. The results of the research open unexpected opportunities to capitalize the ethnoarchaeological potential of other resilient areas in emergent or even developed countries. The complete ethnoarchaeological referential provided by these projects can challenge the paradigms in the fields of world archaeology and ethnoarchaeology of salt.

From among the concrete results, notable is that the systematic ethnographic and surface archaeological research carried out in the proximity and vicinity of the salt springs from the eastern extra-Carpathian area of Romania since 2004 has increased twofold the number of prehistoric sites with evidence of brine exploitation, to a total of 21 sites (Brigand and Weller 2018). Recently, research of this type conducted in 2019 has revealed the oldest (Neolithic) exploitation of salt spring brine in Transylvania (Kavruk et al. 2019). The series of ethnoarchaeological projects developed in Romania between 2007 and 2019 has fundamentally changed the strict archaeological perceptions of the exploitation of salt resources primarily in Europe. The resulting image is highly complex, impossible to be imagined by archaeologists before this work. It turned out that besides the human and animal food and food preservation purpose, there is a whole series of other uses of salt, among which a very important role is played by medical practices.

Completely surprising was the use of brine from salt springs directly in human and animal nutrition, without any other intervention. It follows that the exploitation of salt springs does not involve as a rule the presence of specific archaeological remains. A salt spring can even be exploited intensively without any archaeological trace, if the brine transportation vessels were made of wood or they were ceramic but did not break.

This stunning situation has nothing to do with inferior social status or poverty, it being explained by the special flavor given to the various dishes or the bacon or the preserved vegetables and herbs.

Ethnographic research has led to the construction of original models. We highlight here the radial model of brine distribution from salt springs and salt boulders from exploiting salt outcrops, as well as a classification of human settlements according to salt exploitation points. The first applications of these models to the archaeological past have proven their validity, contributing to a better understanding of the complex role played by salt in the evolution of human communities from anywhere and anytime. Obviously, the relevance of the ethnographic analogies for reconstituting archaeological situations is a crucial problem for ethnoarchaeology. The analogies must not be applied mechanically, *tel quel* and in details, to the archaeological past. My conviction is that these investigations have revealed dimensions of a general nature (e.g., the use of brine directly for human and animal alimentation, without any intervention, spatial distribution, uses, religion, superstitions, symbolism), which were generally overlooked by archaeologists. Strictly for Romania, the relevance of ethnoarchaeological research of this type is enhanced by the fact that they were carried out under the conditions of the unity of place and the continuity of the exploitation of the salt resources.

Cross-References

- ▶ Archaeology of Salt in China
- ▶ Archaeology of Salt in Japan
- ▶ Ethnoarchaeology
- ▶ Ethnoarchaeology of Pastoral Societies
- ▶ Ethnoarchaeology of Salt in Romania
- ▶ Ethnoarchaeology: Approaches to Fieldwork
- ▶ Ethnoarchaeology: Building Frames of Reference for Research
- ▶ Ethnoarchaeology: Learning from Potters in Gilund
- ▶ Foodways in Historical Archaeology
- ▶ South Africa: Maritime Archaeology

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Ethnoarchaeology: Approaches to Fieldwork

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Introduction

Field methods of ethnoarchaeology are based on those of ethnography, but because of the type of information that is sought, there are some record

types that are more specific to archaeology. In other words, fieldwork in ethnoarchaeology is also based on participant observation in living societies, with an attitude of minimal interference in the community under study and a clear research design. However, little has been written and reflected on ethnoarchaeological fieldwork (for exceptions, see David and Kramer 2001: 63–90; Arthur and Weedman 2005), and in general, it is not clearly specified in the reports. There are three defining elements of ethnoarchaeology that have implications in their field methods: *the study of a living culture*, with reference to the *material derivatives of human behavior*, and (when it is in traditional society) the *postcolonial context*.

Key Issues/Current Debates/Future Directions/Examples

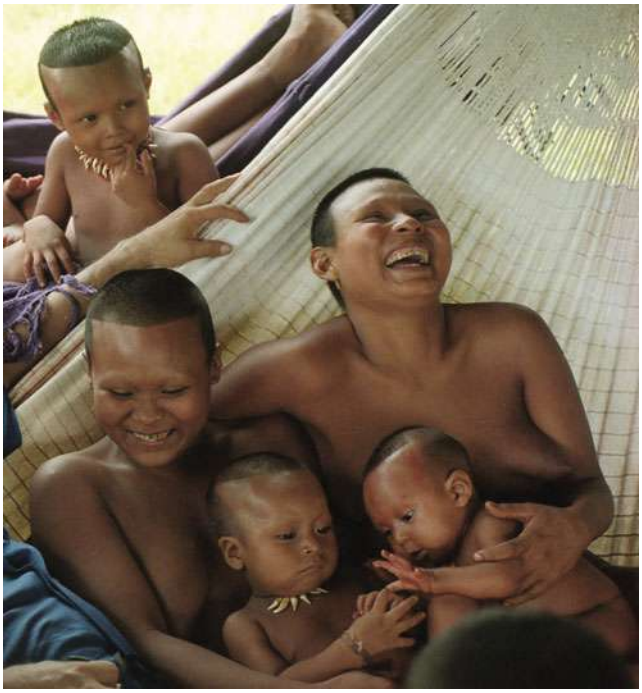
The ethnoarchaeological fieldwork has some peculiarities. First, the overall goals are more limited than those of classical ethnography, since they are usually related to material culture, with the settlement and with the exploitation of the environment and landscape changes. This makes ethnoarchaeological work generally more specific and shorter than those of classical ethnography (although there are exceptions like the research of John Yellen (1977) among the Kung or those of Russell Greaves (2006) among the Pumé). Although post-processual ethnoarchaeology – more hermeneutic – has looked for understanding the cultural context of production of material culture and has paid more attention to emic category, this has not resulted in a substantial increase in the duration of fieldwork campaigns.

Usually, ethnoarchaeology fieldwork is solitary and includes the researcher and eventually an assistant (sometimes a local collaborator or a student) or a translator (not always available). In this way, a closer relationship with the studied community is achieved, a more personal feeling with the informants is developed, and the impact in the community caused during the field work by the researchers is mitigated. Small communities may feel easily invaded by the arrival of several ethnoarchaeologists and collaborators at the same time. This would undoubtedly transform researchers into an uncomfortable presence. However, it would be unfair to consider ethnoarchaeologists as being always disruptive or bothering visitors. In most cases, ethnoarchaeologists are welcome, are a novelty, and a source of entertaining (Fig. 1); in remote communities, they are also a contact with the outside world, and in many instances, they help to make people's problems visible and can be transformed into spokespersons for political demands.

Some long-term projects have required the participation of several researchers at the same time, as seems to have been the case with Binford's work among the Nunamiut (Fig. 2 and also see Fig. 5.3 in David and Kramer 2001). There is also, a long-term, trans-generational research such as the Kalinga Ethnoarchaeology Project (KEP) in Philippines developed since 1973 by Willam Longarce and collaborators. They undertook a ceramic ethnoarchaeological research that explored the intergenerational transmission of style with a focus on ceramic decoration (Stark and Skibo 2007). Given the ambitious objectives of the project, it required multistage research designs which encompass both the record of data throughout several generations of potters and the articulation of the field work of different waves of ethnoarchaeologists. Taken into account the complexity and the duration, this project is unique in the subdiscipline.

Gender bias is an aspect usually overlooked in the ethnoarchaelogical field work (see Weedman 2006). There are many documented cases in which there are activities and rituals forbidden for men, and vice versa, which skews the more or less complete registration of behavioral pattern of a community. Also, assistant or translator can also deepen this bias. Ideally, it would be best if the ethnoarchaeological research teams are composed of researchers and collaborators of both sexes, which is not always possible.

Since ethnoarchaeologists study living cultures with archaeological eyes, they record data such as places for garbage disposal, marks and breaks on a bone and its dispersion in domestic spaces and in the landscape, operational chains and sequence of artifact production, plant, and location of households and villages (Fig. 3). Thus, ethnoarchaeologists



Ethnoarchaeology: Approaches to Fieldwork, Fig. 1 Nukak women laughing at ethnoarchaeologists at the end of a fieldwork at Guaviare Colombian Amazone 1995. (Photo Gustavo Politis)

Ethnoarchaeology: Approaches to Fieldwork, Fig. 2 Lewis Binford (second form the left) and two collaborators going off camp with a Nunamiut man and his dogs. Alaska 1971. (Photo courtesy Amber Johnson)

draw plans, analyze bones, record artifacts, and make maps with the skills that are specific to archaeology. Ethnoarchaeological work often includes the collection of objects and debris, such as faunal remains, the debris of a sequence of stone flaking, or broken pottery sherds, for further study in the laboratory, following analytical techniques from archaeology or taphonomy (see, e.g., O'Connell 1987; Lupo and O'Connell 2002). Likewise, information is often quantified, especially in terms of size, distance, weight, and time (see, e.g., the study of Bird et al. 2009, on daily foraging trips and hunting strategies of the Martu, see also Politis 2007). Francophone ethnoarchaeology has been very much oriented toward the documentation of the technological processes and in the identification

Ethnoarchaeology: Approaches to Fieldwork, Fig. 3 J. Peter White in 1964 in the Legaiyu village, Asaro Valley Eastern Highlands, New Guinea: ethnicity is identified as Gahuku-Gama. White had asked the Indians to carve some nucleus to make some observations controlling some variables. (Photo courtesy of J. Peter White)

of the *chaîne opératoire*, within the anthropological matrix (the "anthropology of techniques," see Pétrequin and Pétrequin 1993). With the advent of post-processual ethnoarchaeology (Hodder 1982), there has been a greater emphasis on understanding the context of material cultural. The article on pottery decoration by David et al. (1988) is a good example of this trend. Moreover, from post-processualism onwards, a more emic perspective has been developed, and efforts have been put into trying to understand how the same people conceptualized and thought about their objects and their behavior and to understand its causes and motivations. Basically, post-processual and hermeneutic ethnoarchaeologists intend to recover the different meanings of material culture and how it operates into several dimensions (beyond the techno-functional).

To simplify something much more complex, it is important to differentiate ethnoarchaeological observations from ethnoarchaeological projects. The former generally occur during a campaign of archaeological fieldwork. Observations made on these occasions are very useful in interpreting a specific context but cannot always elucidate more complex systems or generate more general models. These observations are also frequent producers of "cautionary tales," which help mitigate the ethnocentrism of archaeologists and overthrow assumptions based solely on common sense. Furthermore, ethnoarchaeological projects have an agenda and specific designs and seek to transcend the regional application; generally, they seek to create general models which allow for the connection between human behavior and material culture (the classic studies of Binford 1978, on Nunamiut are a good example of this; see also discussion in Roux 2007) or for understanding the meaning of material production within its social and cultural context (see, e.g., Gosselain 2000).

There are two main types of ethnoarchaeological projects. Those incorporated within archaeological projects and those undertaken on their own account, without direct links to local archaeological research (although these may have originally served as inspiration). Carol Kramer's study (1982) on a vernacular architecture of Iran and Warren DeBoer work (1974) on the pottery from Peru Conibo are classic examples of the former. Ethnoarchaeological studies on Pumé conducted by Greaves (2006) or Kelly (2006) and collaborators of Mikea of Madagascar exemplify the second type.

Although less frequent, ethnoarchaeological research can also be conducted within the framework of ethnographic/social anthropology projects. The famous work of John Yellen among the Kung is one of the exceptions, as it was done as part of the Harvard University Bushman Studies project, led by Richard Lee and Irven DeVore.

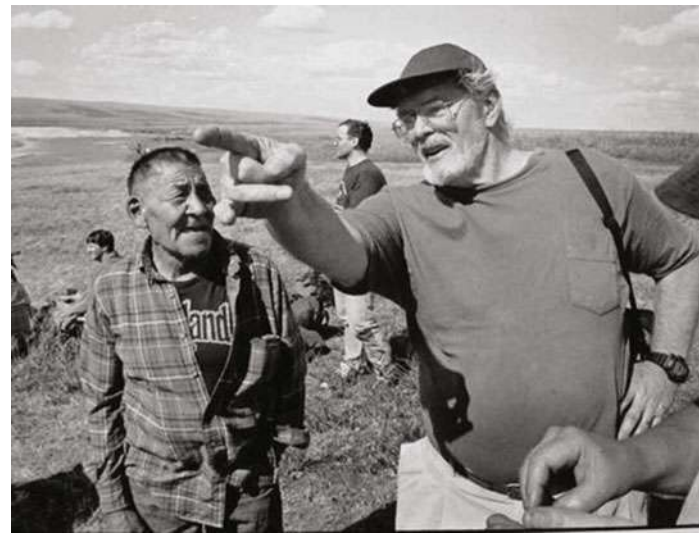
In general, the methods and techniques of data record in ethnoarchaeology have three variants. The first is the record of the daily activities as they happen, with special attention to the materials derived from them and the social and ideational framework within which they occur (see, e.g., Politis 2007). This is the ideal case and should be the most successful for generating analog models. The second variant is when the ethnoarchaeologist requests or promotes the execution of specific activities in order to obtain certain types of information. This variant may allow for a better control of observation, as in experimental archaeology, with the difference that the one holding the experiment is the cultural "other." This situation is common, for example, when the researcher wants to record the making of some artifacts that are no longer made or that were not made during the period of fieldwork. The visit to a stone quarry with three Alyawara men performed by Lewis Binford and James O'Connell (1984) in the early 1980s is a good and well-known example of this variant. The weakness of this second strategy is that it is more difficult to frame the phenomenon in its original cultural context (and so understand its causes and motivations), since induction is applied by the researcher. In both variants, ethnoarchaeologists are making increasingly frequent use of film in addition to graphic and sound recording (Fig. 4), especially taking advantage of digital cameras (Fig. 5).

The third variant uses previous knowledge about the societies to make broader ethnoarchaeological models, spatially and temporally. In this case, the ethnoarchaeologist does not directly "observe" anything but receives oral information about some aspects of the behavior of people in the past and their material implications. Models of residential mobility among Nunamiut made by Binford (1978) are good examples of this third strategy as it incorporates the memory of traditional territories of this people. The study of Mendoza (2003/2004) about the range area and the seasonal campsites of the Toba bands form Western Chaco (Argentina) also nicely illustrate this research strategy. In practice, two or three of these variants are combined in the field. In all three variants, key informants are also used (Fig. 6).

Ethnoarchaeology: Approaches to Fieldwork, Fig. 4 Recording Nukak voices in the Colombian Amazone in 1996. (Photo Gustavo Politis)

Despite the relatively widespread belief that ethnoarchaeologists also dig sites on their field work locations (see for example Laming-Emperaire et al. 1978), this happens rarely now. In general, ethnoarchaeologists generate the models that serve as analogies for human behavior but are not primarily interested in recovering what is left after a place was abandoned. The generation of "archaeological record" is usually observed in real time during the fieldwork and is the interface between the living culture dynamic and static registration, which focuses the ethnoarchaeologists. Thus, the excavation of a site where observations of the living culture have been made does not have much relevance for ethnoarchaeology; the study of differential preservation of the remains belongs to the field of taphonomy and the study of the natural processes of site formation.

Ethnoarchaeology: Approaches to Fieldwork, Fig. 5 Young Awa browsing the digital film machine, during night filming of a Juriti village ritual (Brazil), 2008. (Photo courtesy of Almudena Hernando and Alfredo Gonzalez Ruibal)



Ethnoarchaeology: Approaches to Fieldwork, Fig. 6 Lewis Binford visiting Anaktuvuk Pass in 1999. He is talking to Johnny Rulland who was his "brother" and one of his primary informants. (Photo taken by Grant Spearman. Courtesy of Amber Johnson)

The asymmetrical relation in the field between the "other" that is being studied and the ethnoarchaeologist is another important issue that has been hardly discussed. The selection of key informants or "focal persons" is always problematic and is plagued with scientific and ethical dilemmas (see Fewster 2001; Politis 2015). Moreover, in the common cases of the emergence of leaders that embrace the values of modern society at the expense of their own traditions, the result still generates unbalanced situations. Also, the Westerners' interaction with the traditional societies created or reinforced gender differences that may have not existed before, or not in that degree (Hernando Gonzalo et al. 2011). In fact, not only are many of the accounts supported by allegedly objective observations biased but they also reflect behavior and relationships conditioned by the Western researcher's very presence (Flanagan 1989: 252). It is highly probably that part of the observed actions and answers obtained during this fieldwork is biased due to this asymmetrical situation and/or the gender of the researcher. And this is probably recurrent to all ethnoarchaeological scenarios in the world.

The ethical aspect of fieldwork is crucial (Hodder 1982: 39; Fewster 2001; Davis and Kramer 2001: 84–90). The governing ethical standards and good practice applied to general anthropological research have first priority: this includes

full respect for the community and its customs, minimal interference, and informed consent. This last is sometimes difficult to obtain in its entirety, due to both linguistic and cultural differences. It is often difficult to explain the ethnoarchaeologists' passion for systematically recording (sometimes obsessively) everyday behaviors and conserving what the people studied consider junk. This is of course related to the degree of "Westernization" of the ethnic group in question, but for many traditional societies, the activities carried out by ethnoarchaeologists remain incomprehensible: why pick up and put in bags a lot of dirty bones which do not have any meat? Why draw and map the sherds of broken pottery? Why ask obvious questions all the time? Full and real informed consent can be obtained quite easily in some cases, but it is unrealistic, for example, in the case of more recently contacted or very isolated communities such as the Colombian Amazon Nukak or the Upper Orinoco Hotï. What it is obtained is the agreement for the ethnoarchaeologist to accompany, join, and "observe" in a particular way some people in their everyday activities, but this by no means implies that the observed are fully aware of what the ethnoarchaeological research in question means (Politis 2015). This is an ethical dilemma that is hard to solve.

One of the topics discussed recently is the postcolonial nature of ethnoarchaeological research and the legitimacy of studying a "cultural other" whose current situation is the result of colonial practices along several centuries. This is related to the colonial heritage of anthropology, and ethnoarchaeology does not escape this sin of origin. Field methods are impregnated with this critique and every effort should be made to decolonize the practice of ethnoarchaeology (Cunningham and MacEachern 2016; Weedman Arthur 2018). One of the strategies that are being carried out is to make an ethnoarchaeology *with* people, through which the "other" studied has a more active role in the research process, in the design of the project and that somehow participates in the profit of the results, This kind of de-colonial practice has a very strong impact on fieldwork and forces the creation of specific methods and techniques, so that without losing some rigor in the investigation, other patterns of rationality and other cosmologies can be incorporated. This challenge implies a new type of field work that is currently in early stages of development. In Brazil, this kind of research is becoming frequent under the label of collaborative ethnoarchaeology (Silva 2009) (Fig. 7). This also would drive to some phenomenological approaches which have been

Ethnoarchaeology: Approaches to Fieldwork,
Fig. 7 Brazilian ethnoarchaeologist Fabiola Silva among the Asurini in the Kwatinemu village. She is organizing a trip in 2010 with Asurini people. (Photo courtesy of Fabiola Silva)

criticized since the inception of ethnoarchaeology: Watson (1979) was worried that the temptation of "going native" would produce the loss of analytical perspective.

Finally, the continual disruption of traditional or preindustrial lifestyles, the growing processes of ethnogenesis, and the steady advance of globalization are leading to the demise of practices which help observers interpret the past. Within this orbit, ethnoarchaeology is reorienting its strategies and objects of study, and some variants of this new trend are turning to what has been called the archaeology of the present (González Ruibal 2009) or archaeological ethnographies (Hamilakis and Anagnostopulos 2009). This has led to a redesign of a new methodology in the field methods.

Cross-References

- ▶ Binford, Lewis R. (Theory)
- ▶ Ethnoarchaeology

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Ethnoarchaeology: Building Frames of Reference for Research

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Introduction and Definition

Ethnoarchaeology is a powerful strategy for structuring archaeological research questions that uses ethnographic information to make inferences about the material residues of past human activities. Ethnoarchaeology is not a theoretical approach per se, so it can investigate research questions generated from a wide variety of theoretical perspectives. Ethnoarchaeological scopes and scales of research are expanding rapidly in geography, chronology, method, and theoretical stance, from variables conditioning the manufacture of traditional technology to the evolution of symbolic expression and ritual behaviors.

Ethnoarchaeologists are uniquely positioned to construct frames of reference to aid archaeological inquiry. In this entry, "frame of reference" is defined as a *research strategy that makes projections from a better-known domain of knowledge to a less-well-known domain*. Ethnoarchaeologists examine variation in characteristics of an independent, related body of knowledge (ethnographic data) to generate frames of reference for testing and refining research about less well-known phenomena (the ways that human activities are expressed in the archaeological record and implications of the archaeological record for past activities).

Ethnoarchaeology has been described as a subset of actualistic archaeology, but unlike experimental archaeology, which is conducted under acultural, controlled laboratory conditions, ethnoarchaeology documents and analyzes behaviors that are observed or described in ethnographic settings. Unlike ethnographic analogy, which identifies similarities and infers similar causal mechanisms, and the direct historical approach, which imposes traits of present-day material culture directly onto the archaeological record, ethnoarchaeology usually takes the intermediate step of developing frames of reference to investigate the archaeological record. Human behavioral ecology and biosocial anthropology also employ real-time observations of human societies as means to structure research problems but are more narrowly concerned with biologically expressed evolutionary aspects of human behavior (Fig. 1).

There is some overlap between ethnoarchaeology and actualistic research strategies, but ethnoarchaeology does have important characteristics that define it as a separate subdiscipline of archaeology: the most significant being the conceptual linkage between the two domains of ethnography and archaeology. This entry begins with a summary of the history of ethnoarchaeology (for a more detailed review, see David and Kramer 2001) and moves on to describe functions of ethnoarchaeology in various arenas of method and theory; explore key issues, current debates, and critiques; and discuss future trends and opportunities.

Historical Background

The history of ethnoarchaeology can be summarized in four main periods of growth, drawn loosely from David and Kramer (2001). Like the archaeological record itself, the history of

Ethnoarchaeology: Building Frames of Reference for Research, Fig. 1 Quechuan woman deploys a sling, Central Peru, observed by members of her community and Margaret Brown Vega. (Photo: Nathan Craig)

ethnoarchaeology is a palimpsest; traces of early tactics and perspectives can still be discerned in ethnoarchaeological research today, although they may be situated in new geographic or culture-historical contexts.

Initial Period, 1956–1967

The term "ethnoarchaeology" was first coined in 1900 by Jesse Fewkes, who was describing the direct application of present-day cultural phenomena to materials left behind by past behavior. In 1948 Walter Taylor advocated the need for a "conjunctive archaeology" that brought anthropological techniques of observation and categories of data into archaeological research. Female researchers were proponents of ethnoarchaeology early on, evidenced by Patty Jo Watson's 1950s work in Iraq, Iran, and Turkey and Maxine Kleindienst's interest in the African Paleolithic (Kleindienst and Watson 1956). The call of Taylor, Watson and Kleindienst, and others to integrate ethnographic and archaeological patterning grew from dissatisfaction with the "mainstream" strategy in the early to mid-twentieth century, which emphasized analytical categories. Culture-historical archaeology mostly involved excavating sites with relatively rich, well-stratified arrays of material remains; grouping their stylistic elements into formal artifact types; tracing the distribution of those types through time and space; identifying bounded, co-occurring sets of types as archaeological "cultures"; and explaining changes in composition and distribution by reference to past movements of people or ideas or both (O'Connell 2011).

Most early ethnoarchaeological approaches superimposed cultural phenomena observed in the present directly onto material traces of the past, and this had some success in cases where cultural continuity was strong. Analogical approaches during this time largely explored the parameters of artifact manufacture, focusing on characteristics that are visible in the archaeological record. Spatial analyses of living spaces at that time were scarce and served mostly as cautionary tales against unwarranted inferences about site structure and function (Heider 1961). This early role of ethnoarchaeology as a check and balance against "just-so stories" is still relevant today (Gifford-Gonzales 2010).

New Ethnoarchaeology, 1968–1981

The emergence of ethnoarchaeology as a major subdiscipline was linked with the advent of cultural ecology studies that documented human subsistence, technology, and mobility as essential indicators of the dynamic relationship between societies and their home environments (cf. Steward 1955). Archaeologists, moving from discernment of categories of artifacts toward descriptions of dynamic adaptive systems, realized that frames of reference were needed to explain the relationships between properties of the archaeological record and behaviors that condition for those properties. Lewis Binford's series of publications in the 1960s asserted that archaeologists must not only use anthropological information but become proficient in anthropology in order to build frames of reference for

archaeological research problems. The groundwork for ethnoarchaeological fieldwork among the Nunamiut in the 1970s grew from his doubts about F. Bordes's "ethnic geography" of Mousterian tools; Binford felt that Mousterian technological variation could be functional, but realized that he needed a frame of reference about arctic hunting tools and lifeways (Binford, personal communication). In the 1960s and 1970s, most proponents of the New Archaeology focused on adaptive systems and processual change rather than ideology and symbolic thought, and they found a ready source of baseline information in ethnoarchaeology. At about the same time, Richard Gould was conducting ethnoarchaeological fieldwork among the Ngatadjara peoples of the Australian Western Desert. His interests in symbolic and ideational behaviors led him to assert that these behaviors could be discerned in the archaeological record by identifying the anomalies between archaeological expectations and ethnographic observations.

Ethnoarchaeology underwent a brisk self-examination in the 1970s and early 1980s in a series of debating articles between Gould and Binford: Gould (1980) asserted that the proper research objectives of anthropology are symbolism and meaning, thereby confining ethnoarchaeology to the more humble realms of behavior that generate archaeologically visible material residues (e.g., cooking, toolmaking, and house construction). The danger of investigating *only* materially significant behaviors was a uniformitarian, determinist view of human culture as materially dictated. Binford countered that culture mediates human interactions with the world, and variability in those culture-environment interactions are patterned, with material signatures that are observable anthropologically (Binford 1989). This back-and-forth discussion, never "resolved," foreshadowed the vigorous processual/post-processual debates that began in the mid-1980s and continue today (see below).

The geographic scope of ethnoarchaeology expanded during the 1960s and 1970s to include nearly every region of the world, with particularly active research programs in sub-Saharan Africa and Australia. Nearly every level of societal organization was investigated with emphasis on foraging peoples, but industrialized or "state"-level societies were underrepresented during this period. Not surprisingly, accumulating ethnoarchaeological data led to the realization that linkages between behaviors and their archaeological consequences are complex. New archaeologists who sought large generalizations felt that ethnoarchaeological data were sometimes too particularistic due to the "embedded" nature of the data collection process. The 1980s arrived with no grand unifying theory of archaeology in place, but the wealth of data generated by pioneering ethnoarchaeological fieldwork during this time period remains highly influential to archaeological and anthropological research today.

Expansive Period, 1982–1999

With the advent of post-processual archaeology in the 1980s and 1990s, Hodder (1982), David et al. (1988), and others employed ethnographic information to argue that symbolism, ideation, meaning, and identity are active formative agents in the archaeological record and that material culture is itself an active agent of communication. Ethnoarchaeology was now called upon to document the social, ritual, and geopolitical contexts within which behaviors play out and the ways that materials are made, used, and employed as social and ritual symbols. Along with reflexive anthropology, which reoriented the object of inquiry from observed to the observer by making explicit the observer's sociopolitical position, post-processual archaeology focused on subjective interpretations of the textual or narrative aspects of the material record, which was described as a series of symbols. The persons conducting ethnoarchaeology were viewed as active agents of communication who influence research outcomes in non-replicable ways. Although post-processual approaches may have influenced ethnoarchaeology less than other research strategies, post-processualism addressed ritual and ideational behavior in a more robust manner than the "new ethnoarchaeology" and led to a growth of interest in complex, sedentized societies with a more robust material record of symbolic and textual expression.

Recent Diversifying Period, 2000–2011

Ethnoarchaeology in the 2000s has expanded to include processual, science-oriented forms of inquiry about variability and evolution that involve explanation of differences and similarities as well as post-processual explorations of the ways that researcher and researched explore meaning and reify their own connections to the past: for a good cross section of current variability in ethnoarchaeological research problems, see the SAA Archaeological Record, Volumes 9(5) and 10(1). Ethnoarchaeology contains enormous potential to contribute fine-grained, reliable information to heritage and identity studies, which has captured the interest of scholars associated with descendant communities. Ethnoarchaeology has become a major contributor to intangible archaeology by documenting spiritual implications of seemingly utilitarian objects and helping to document and pass on key language terms and traditional skills to the next generation. The social systems studied in ethnoarchaeology now include foragers, horticulturalists, pastoralists, industrialized urban peoples, as well as occupational specialists from every socioeconomic status and corner of the globe. Research topics range from lithic tool production to the study of material expressions in urban Middle America. In the past three decades, the transformation of the main job market from academia to cultural resources management and other forms of public archaeology – particularly in North America – has given rise to the citation of ethnoarchaeological research for rapid diagnostic ascriptions of archaeological materials, features, and settlement complexes. Women researchers, always well represented in ethnoarchaeology, are growing in number; in the recent double issue of the Society for American Archaeology's Archaeological Record in 2009 and 2010, women authors outnumbered men by eight to two.

Key Issues and Current Debates

Functions of Ethnoarchaeology

Ethnoarchaeology as a research strategy is a chameleon, taking on different shades from the contexts of its use. Gifford-Gonzales (2010) notes that ethnoarchaeology has functioned in the larger landscape of anthropology as

- A category checker for implicit assumptions or analytic categories of archaeological materials
- A prediction tester for hypothetical statements drawn from a formal body of theory
- A middle-range theory builder that defines relational analogies in ways that are relevant to the formation of the archaeological record

These functions are generally "built in" by researchers during the formulation of research designs. Other important functions of ethnoarchaeology may become apparent after the conclusion of research, sometimes many decades afterward. In these cases, people come to realize that ethnoarchaeology has also served as

- A spoiler to received wisdom, disproving generalizations and revealing unanticipated variability
- A heritage keeper for descendant groups who have inhabited a region for long periods
- A public relations bridge builder that shows archaeologists engaging directly with living people and societies

Sometimes unintentionally, the ethnoarchaeologist may find herself or himself acquiring bodies of knowledge that are outside the "traditional" confines of archaeology; these could range from proficiency in indigenous languages to an ability to identify dozens of species of fish to competency in traditional skills like weaving, butchering, or home construction. Thus an important "after-the-fact" function of ethnoarchaeology is to broaden the experiential, intellectual, and ethical repertoire of archaeologists (Fig. 2).

Ethnoarchaeological Research Problems and Strategies

When these many functions are overlaid with different theoretical perspectives, the variation in uses of ethnoarchaeological research questions can be breathtaking, reflecting a very broad spectrum of anthropological and archaeological

Ethnoarchaeology: Building Frames of Reference for Research, Fig. 2 Claudia Chang talking to a Greek woman herder in Grevena in the late 1980s. (Photo: Perry A. Tourtellotte)

research domains. The below categories are derived from David and Kramer (2001), in approximate chronological order of appearance and emphasis. Ethnoarchaeology has been, and is, employed to study

1. The ways that residues of human activities enter archaeological contexts
2. Mobility, at varying temporal, spatial, and organizational scales
3. Subsistence, including procurement and processing
4. Artifacts, including functions, as elements of technological systems; operating sequences; and taxonomic categories
5. Style and the marking of boundaries including regional studies
6. Settlement systems and patterns
7. Site formation and structure
8. Architecture, including form, construction, function, and context
9. Specialist craft production and apprenticeship
10. Trade and exchange
11. Systems of thought such as status, ideology, and mortuary practices

This list is evolving with each passing day. Emphasis in the 1960s and 1970s centered on foraging and small-scale horticultural societies with a focus on hunting and processing of game animals, production of lithic tools, and frequent mobility. Over the decades, ethnoarchaeological research has diversified to agriculturalists, pastoralists, fishing societies, and urban settings; craft specializations such as ceramics, weaving, and metallurgy are well represented.

There are very few people who identify themselves as full-time ethnoarchaeologists; rather, ethnoarchaeology is conducted by researchers trained as archaeologists in the broader sense. Whether a student or an "old hand," identifying the best data to collect – and the means to collect them – is a major challenge to the ethnoarchaeological researcher. Simple questions such as "Where should I go, and how long should I stay? Whom should I talk to? What should I observe?" can generate complex research logistics. In the field, duration of the research can play a key role in the applicability of data to the research problem; seasonal, interannual, or long-term variation is unlikely to be reflected in a 2-week field stay. But a researcher interested in manufacture of a specialized artifact type can focus field time and target observations more narrowly.

Techniques for collection of quantified data might include item counts, identifications (of species, material types, methods, architectural traits, etc.), weights, durations, measures of distance, and demographic

information. Archaeologists' proficiency at map-making and visual data collection like photography is very useful. Methods borrowed from the field of human ecology have proven quite transferable and include "scans" (cyclical observations of varied phenomena, such as walking through a camp and recording all activities at hourly intervals) and "focals" (targeted on individuals or activities and collected in a continuous stream for the duration of the activity, such as observing a man making a mask or following a woman on a trip to gather weaving materials). Scans provide low-resolution data at large spatial and temporal scales that offer opportunities for pattern recognition and generalizations, and focals generate high-resolution information at smaller scales that illuminate the ways that individuals operationalize bodies of knowledge in specific contexts.

The role of qualitative data is complementary and essential. Interviews and direct participation in activities (nearly always as a clumsy acolyte) can capture nuances and variability that do not manifest in quantitative data. Children and teenagers who are still in the learning phases, and enjoy interacting with unusual grown-ups, can be particularly effective language coaches, teachers, and informants. Photographs, video, and audible recordings are precious forms of documentation that can be referenced in the remote future for a wide variety of research questions. When considering ethnoarchaeological research design, it is important to consider the comfort level of the study community and its individual members with the presence of a researcher. Techniques that require prolonged observation periods in houses, or focal follows of individuals, are obviously invasive, especially early in the acquaintance between the researcher and the community. These techniques are best undertaken after a preliminary adjustment period in which the researcher becomes a known, and hopefully trusted, entity (also see Critiques, below).

Although the most visible and charismatic form of ethnoarchaeological data collection is direct engagement with traditional peoples in the field, background information collected in library settings is an essential pre-field step for structuring and refining research questions. Consulting library sources post-field will likely provide insights in the light of the ethnoarchaeologists' newly acquired knowledge. Too, traditional experts are not always available to the researcher; lifeways may have changed or vanished. In these cases, collection and analysis of ethnographic library sources alone can also contribute to original and useful hypothetical statements about material correlates of behavior and organization that can be assessed with archaeological data.

Critiquing Goals of Ethnoarchaeology

Because ethnoarchaeological research comes in every theoretical stripe, it is subject to an equally wide spectrum of critique. Ethnoarchaeology has been called particularistic by processualists, deterministic by post-processualists, and colonialist and reductive by descendant communities. This entry focuses on critiques of ethnoarchaeology as a research strategy and the ways that ethnoarchaeologically derived arguments about key linkages can lead to weak or inaccurate inferences. Wobst (1978) makes a strong case against directly superimposing ethnographic observations, which are localized and temporally narrow, to archaeological data, which reflect long periods of time and/or clusters of sites or regional scales. This could be read as a critique of ethnoarchaeology, particularly in its early career as a fairly direct means of comparison. The intervening step of deriving a hypothesis from appropriately scaled ethnographic observations (e.g., numerous comparable observations on similar subject matter or observations taken from a large spatial area) that can be tested using archaeological data should, in most cases, alleviate the issue raised by Wobst.

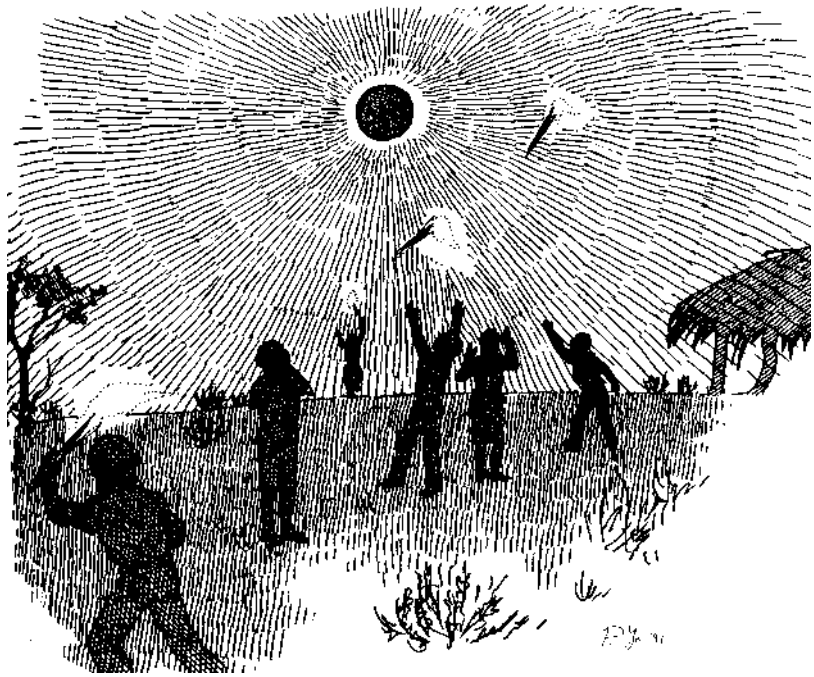
Obviously, the successful application of ethnoarchaeological observations to archaeological problems requires the researcher to understand the context and applicability of observations, and a reasonable critique is that ethnographic techniques can never "perfectly" capture phenomena. If an observed behavior or relationship is anomalous, or observed/interpreted in error, the usefulness of the research is lost or reduced. This can result from insufficient consideration of variability (such as overstating the applicability of a small-scale observation) or observations never

made (a researcher cannot be everywhere at once and may miss important facets or variations of systemic relationships). Something as simple as unwillingness of a host community or informant to discuss a sensitive subject, or insufficient control of the language by the researcher, can also compromise the accuracy of observations. Addressing this critique requires careful attention to the context and applicability of observations to one's research problem, adjusting as needed, and acknowledging data gaps and future research needs.

A related critique of ethnoarchaeology as a research strategy is insufficient integrity or "authenticity" of the traditional nature of the study culture (e.g., Belcher 2009; Jones 2009; Hudson 2010). The excitement and controversy generated by discoveries of the Tasaday and other small, allegedly pristine "Stone Age" groups highlight the hunger of the academy and the larger public for cultures unaltered by the modern world. Once more, ethnoarchaeologists must emphasize the role of the intermediary role of the frame of reference, which requires that the research question specify scales of observation, and exercise control over properties that vary and those that are held constant. For example, an ethnoarchaeological investigation of wild plant gathering might note that women climbed through barbed wire fences and carried metal machetes. This does not compromise the value of observations of, say, the number and type of plants gathered, the decision when to leave a patch, the relative contribution of young girls and a blind woman in the group, and distribution of raw and cooked plant foods to family members back at camp. However, if the women hitch a ride to the gathering site on a friendly rancher's truck, this obviously reduces this trip's explanatory power for patterns of mobility. A similar issue is lack of control over context: no field conditions today can approach the conditions encountered by foragers colonizing the Australian Western Desert in the Pleistocene, for example. No people (or animals) resemble Pliocene hominids today, so using ethnographic information to explore Pliocene behaviors is risky according to paleoanthropologists (Liebermann et al. 2007). Addressing conditions for which there is no modern comparative context requires close control over variables and clear, defensible rationales for the derivation of ethnoarchaeological frames of reference and their application to archaeological questions (Fig. 3).

Related to the above is inadequate applicability or "fit" of ethnographic observations to the archaeological record, a very common critique. Ethnoarchaeologists frequently find themselves explaining to a variety of audiences why motorized transportation, modern tools, wage labor, loss of language, participation in the national education system, nontraditional clothing, manufactured items and commodity foods, and other influences of the globalized culture and economy do not *necessarily* compromise the value of ethnoarchaeological observations. Global influences cannot be ruled out in most ethnoarchaeological field contexts, and (as with the Pliocene case above) ethnoarchaeologists must maintain good control over variables, describe defensible rationales for deriving ethnoarchaeological frames of reference, and explain clearly their application to archaeological questions. This is no reason to cease the practice of ethnoarchaeology: indeed, the continual influence of industrialized, globalized society and its material forces on traditional life and culture enhance the research utility and heritage value of ethnoarchaeological observations.

The uneven use of ethnoarchaeological concepts in public archaeology has received its share of criticism. Few archaeologists working in public archaeology have not seen the forager/collector dichotomy (Binford 1980) invoked to explain everything from site distribution and structure to lithics, along with curated/expedient tools, and MNI/NISP for faunal remains, particularly in dealing with foraging cultures. Simplistic application of ethnoarchaeological categories can be a cost-effective way to "interpret" the archaeological record, leading to hasty assignment of archaeological materials to established, prescriptive categories. This is reminiscent of culture-historical taxonomics and forecloses the strength of ethnoarchaeological research, which lies in the formation of frames of reference prior to data analysis. However, ethnoarchaeology has an



Ethnoarchaeology: Building Frames of Reference for Research, Fig. 3 Illustration of rituals associated with lunar eclipse, Doro Ana community of Pumé Indians, Venezuela, 1993. (Illus. by Pei-Lin Yu)

important role to play in public sector archaeology; data can contain information of immense value in hypothesis generation and testing for cultural resources-related research. In the past 20 years, descendant communities have become professionally involved with the practice and goals of public archaeology and are recruiting ethnoarchaeological information for the preservation, protection, and perpetuation of cultural heritage in both tangible and intangible realms.

Critiquing Methods of Ethnoarchaeology

The unpredictability of fieldwork is particularly high in ethnoarchaeology; a reasonable critique is the likelihood that unanticipated field conditions will compromise a research agenda. If ethnographic background data used to structure the research question are not adequate or field conditions (geopolitical, socioeconomic, environmental, climatic, etc.) are dramatically different from those anticipated, the researcher must be prepared to adjust data collection methods or even research questions, all while living under conditions that are challenging in and of themselves. For this reason, many ethnoarchaeological research programs build in a brief reconnaissance prior to the main body of fieldwork, to assess conditions and make adjustments. Failing to account for the influence of a researcher in the community and resulting compromise in the validity of observations constitutes another basis for methodological critique; the immediate local economy is altered by trade relationships or provision of goods or wages, and the status of the community relative to neighbors and the government will almost certainly change. Researchers bringing food or tools for themselves or the community, or providing medicines or trade goods, can have a huge influence on a small traditional community – sometimes leading to undesirable impacts. These considerations should be front and center when planning for ethnoarchaeological research.

Critiquing Ethics of Ethnoarchaeology

The ethical landscape affects how ethnoarchaeological research is structured, carried out, interpreted, applied, and referenced. More importantly, ethical decisions that a researcher must make on a daily basis can have a disproportionate effect on the economic, physical, emotional, and spiritual health of the community and its members. Many ethical issues echo those of ethnographic fieldwork: how should the researcher reimburse people for information? If yes, how?

For shouldering the burden of a naïve anthropologist living in their midst who often must be fed, protected, housed, and instructed? Is it appropriate to enter into wage relationships for services like laundry, housecleaning, and food? Should an ethnoarchaeologist interfere in situations like the perceived mistreatment of a child or a helpless person? What about reporting abuses or crimes perpetrated by neighbors, local military, or local governments? How should the ethnoarchaeologist best protect sacred or other sensitive information? What about personal involvement with a community member? Each situation will require careful, and sometimes very rapid, decision-making – and "one size does not fit all." One guarantee in ethnoarchaeological fieldwork is that the ethnoarchaeologist will be called upon to deal with ethical situations that she or he has not anticipated, which increases the value of a short reconnaissance before major fieldwork.

Critiques from within and without have strengthened and refined this uniquely productive and powerful research strategy and are worth careful consideration by practicing ethnoarchaeologists, students of ethnoarchaeology, and scholars who use ethnoarchaeological data collected by others. Taking steps to avoid, offset, or remedy theoretical, methodological, and ethical pitfalls involves background research, discussions with experienced field researchers, and excellent communication skills with communities in which researchers live and study.

International Perspectives

As the theoretical stage of ethnoarchaeological practice has broadened, so has its use by non-Western researchers from all over the globe. Some areas of emphasis are listed in Table 1 below, summarized from David and Kramer (2001) and a survey of recent journal articles in international ethnoarchaeology.

Underrepresented in this listing are South America, North America, and Australia. Although robust ethnoarchaeological research has been carried out in these countries, researchers are usually of Western European or Euro-American origin. This situation likely reflects low numbers of archaeologists of non-European descent in nations with colonial pasts. However, the growth of legislation mandating cultural resources management-related archaeology is fostering the growth of Native American archaeology programs and students in North and South America. Increasing research partnerships between archaeologists and Australia's First Peoples are gradually integrating scientific and cultural heritage perspectives on the goals and techniques of research about ancient peoples.

Ethnoarchaeology: Building Frames of Reference for Research, Table 1 A sampling of topics in non-Western ethnoarchaeological research

Research subject	Geographic area
Ceramic-making and its larger role in society	Philippines, Mexico
Settlement patterns as they relate to house construction, agricultural practices, ethnohistory, ethnogenesis, and community interactions	Africa, China, Palestine
Material expression of symbolic behavior, including animal sacrifice and mask design/construction	Africa
Metallurgy	India, Africa
Agropastoralism	India
Post-disaster recovery subsistence and exchange	Iran
Tropical mobility and technology, architecture and settlement	South America

Regardless of the ethnicity of the person collecting the information, there is considerable overlap in the value of ethnoarchaeological data to both scientific and traditional domains of knowledge. "Salvage ethnoarchaeology" can help document and perpetuate lifeways that are in danger of being overwhelmed by global culture and economies. This contributes to the stewardship of heritage both tangible and intangible. Ethnoarchaeology carried out "of the people, by the people, for the people" can provide data that are simultaneously

- Germane to archaeological inquiry
- Relevant to heritage resource managers, museums, and heritage tourism
- Essential to descendants striving to maintain and transfer traditional knowledge, skills, techniques, materials, and worldviews (also see Conte 2006)

Future Directions

Ethnoarchaeology is maturing as a research strategy. David and Kramer (2001) describe maturity as "progressive incorporation into the discipline from a variety of viewpoints within a broadly agreed philosophical framework, a range of lively approaches to diverse subject matter, and the appearance of second generation studies that group and synthesize individual case studies" (31). There is no doubt that ethnoarchaeological data will continue to inform and structure archaeological research far into the future; the value of these data grows daily as traditional knowledge becomes transformed by global culture and economy. When combined with expansion of the research enterprise to archaeologists from increasingly diverse cultural backgrounds, the scope, depth, and societal value of ethnoarchaeological research will continue to broaden (although the data collected may become less obviously generalizable, at least in the short run).

That said, the boundary between "scientific/theoretical" and "heritage" ethnoarchaeology is porous and mutually beneficial. Lewis Binford noted that members of the Nunamiut community felt his research was very important and directed children to watch elders as they demonstrated traditional hunting, butchering, and construction techniques for anthropologists. Children followed Binford and his crew around on their mapping trips (Binford, personal communication 2006). The author of this entry was recruited as a "teaching tool" by Pumé parents and grandparents during fieldwork in Venezuela, and educating the anthropologist in traditional skills and knowledge provided one more way for the Pumé to maintain continuity and integrity for the next generation (Yu 1997). Ethnoarchaeological data collected and used for research purposes have irreplaceable, and growing, value for other anthropologists and the traditional peoples of the world. The ethnoarchaeological data collected today certainly possess scientific and heritage value that may not be obvious today.

Cross-References

- ▶ Analogy in Archaeological Theory
- ▶ Archaeology as Anthropology
- ▶ Binford, Lewis R. (Hunter-Gatherer and Mid-Range Societies)
- ▶ Ethnoarchaeology
- ▶ Ethnoarchaeology: Approaches to Fieldwork
- ▶ Ethnoarchaeology: Learning from Potters in Gilund
- ▶ Heritage Museums and the Public
- ▶ Heritage Tourism and the Marketplace
- ▶ Hunter-Gatherers, Archaeology of
- ▶ Indigenous Peoples, Working with and for
- ▶ Middle-Range Theory in Archaeology
- ▶ New Archaeology, Development of
- ▶ Post-Processual Archaeology
- ▶ Processualism in Archaeological Theory

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Ethnoarchaeology: Learning from Potters in Gilund

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Introduction and Definition

Ethnoarchaeology is an ever-expanding sub-discipline within archaeology, and pottery undoubtedly gets more than its fair share of attention. But with recent social and economic trends, it can be seen that opportunities of undertaking certain kinds of ethnoarchaeological study are themselves diminishing. By an interesting coincidence, the village of Gilund in Rajasthan, NW India, was host to an important early third millennium BCE, Chalcolithic settlement of Ahar-Banas Complex (Sankalia et al. 1969; Shinde and Possehl 2005), and at the same time to some of the last indigenous potters still working in the twenty-first century CE. The modern village of Gilund is located approximately 1.5 km from the archaeological site of Gilund, northeast of the modern village. The potters are locally called *Kumhar*. According to the potters and their family members, use of earthenware or ceramic vessels is no longer profitable because of modernization and the popularity of stainless steel vessels. None of their children have taken up this tradition, which is therefore likely to disappear with the present generation of adults. These potters will be the last to practice, and in this respect ethnoarchaeology is itself under threat (Fig. 1).

Key Issues/Current Debates/Future Directions/Examples

All the potters in Gilund obtain clay from the same source, named Soniana, which lies approximately 8 km to the northwest of the village. On rare occasions, usually for emergency purposes when demand is higher than expected, the potters get clay from a location much closer to the village named *taknivali nadi*. In this case, the clay is transported to their homes by donkey which is owned by them. Pottery produced in Gilund is customarily ornamented with red and white pigment. The red pigment locally called *harmachh* and the white pigment locally called *Khadi* are brought from a market in Gangapur, which is approximately 25 km from Gilund. The potters purchase one year's worth of pigment at a time.

Potters in Gilund usually prepare their clay 2–3 h before they plan to make vessels. The raw clay is first pounded to reach to a finer consistency and then sometimes sieved in order to remove large impurities. Water is then added to the crushed clay and wedged until it has a sticky yet elastic consistency. Some potters add ash or dried donkey dung to their clay as tempering material.

Ethnoarchaeology: Learning from Potters in Gilund, Fig. 1 Women carrying both earthen ware vessels and steel vessels during a marriage ceremony in Gilund village (Sarkar 2011)

After a vessel is shaped on the wheel and dried to leather-hard condition, it is then carefully beaten to achieve the required shape by using a marble dabber – *pindi* in the local Mewari dialect – and the other implement used is a wooden tool called *thapa*, which looks like a table tennis bat.

After the vessel is made on the wheel and then beaten to its required shape, the outer surface is rolled in ash, locally called *bani*. Once dried in the sun, the vessel is then dipped into a liquid of dissolved red pigment. The most common surface treatment is painting. The pots are painted in both geometric and naturalistic designs. These include straight and wavy lines, dots, and leaf and peacock designs. Most of the surface treatment and design is done by women of the family, both old and young, using a paint brush of donkey tail hair. Pots are open fired in fields close to the potters' houses or in the workshops themselves. Generally, cow dung, wood, and twigs are used as fuels.

The modern pottery of Gilund village (Sarkar 2011a, b) can be classified into types used for storage, cooking and food processing, eating and drinking, ceremonial, and miscellaneous, following the typology designed by Dr. Malti Nagar at Parla (Nagar 1967). *Storage and cooking vessels* include the *matka*, a big globular pot with broad mouth, round belly, and base. It is used for fetching water and for liquid storage, particularly for water and butter milk. *Matki* is a smaller version of the matka with the same function. *Pauni* is a *tawa* (slightly concave disk-shaped griddle) for making *chapatti* (flat bread made of whole wheat flour). A *Kelaria* is similar to a *pauni* but comparatively deeper. *Kala handi* or *munho* is narrow-mouthed carinated cooking pot mostly used for making butter milk. They are burnished on the outer surface. *Chuklio* and *nani chuklio* are small globular pots used for drinking water or transferring water from larger pot.

Ceremonial vessels include *dhupania* which are incense stands used in worship and in rituals. *Karva* are small globular spouted pots used by married Hindu women during *Karvachaut* (a festival celebrated by Hindu married women where they keep fast that ensures the well-being, prosperity, and longevity of their husbands). *Dela* is similar to *karva* without the spout and is used by the Hindus to proffer offerings in death rituals. A similar vessel is used by Muslims in the village to drink water. *Bijora*, *dhakno*, *dhakni*, and *dhankan* take the form of small goblets with narrow mouths and pointed bases. *Miscellaneous vessels* include the *gurga* – a stand. A handi-like vessel is made first; it is then separated along the line of carination. The upper part is used as stand for seating cooking vessels over chulhas, and the

lower portion is used as tawa. A *galla* is a coin box, for collecting money. *Deepak* are lamps.

The prehistoric Chalcolithic people at Gilund seem to have used narrow-mouthed and wide-mouthed globular jars in coarse red ware and thick red slipped ware which are very similar to modern *matka* and *matki*. Similarly, the carinated wide-mouthed cooking vessels in gray ware recall present-day *handi* produced in Gilund Village (Fig. 2).

Another remarkable resemblance is found between the present-day *dhupania*, which are incense stands used in worship, with dishes-on-stands and bowls-on-stands retrieved from Ahar-Banas Complex sites (Sankalia et al. 1969) (Fig. 3).

Further striking similarity may be noted between a vessel from the Ahar excavation described as "crucible-like with slightly sloping sides, bulbous at the belly, rimless" to that of the vessel in which *lassi* (butter milk) is sold on trains in Rajasthan. There is even similarity in the painted decorations. Present-day potters in Gilund village use painted motifs such as groups of straight or wavy lines, dots, and hatched diamonds, which parallel Chalcolithic buff ware and BRW's groups of straight or wavy lines, spirals, dots, hatched diamonds, concentric circles, and chevrons filled with dots and circles (Sankalia et al. 1969: 88–98) (Fig. 4).

Thus, ethnographic data gathered from the present village potters of Gilund has been able to

Ethnoarchaeology: Learning from Potters in Gilund, Fig. 2 (*Left*) Chalcolithic, narrow-mouthed, globular pot in thick red slipped ware from Gilund; (*right*) modern day matka (Sarkar 2011)

Ethnoarchaeology: Learning from Potters in Gilund, Fig. 3 (*Left*) Modern day dhupania manufactured in Gilund village; (*right*) Chalcolithic bowl-on-stand reported from Ahar (courtesy of Deccan College) (Sarkar 2011)

Ethnoarchaeology: Learning from Potters in Gilund, Fig. 4 (*Left*) Example of Chalcolithic painting on buff ware reported from Ahar; (*right*) similar painting executed on present-day pots in Gilund (Sarkar 2011)

throw some light on the Chalcolithic pottery of Ahar-Banas Complex including likely methods of manufacture and the possible functions of certain ancient vessel forms. This shows that ethnographic data helps us in providing insights into the technology and behavior of prehistoric people.

Cross-References

- ▶ Ethnoarchaeology
- ▶ Ethnoarchaeology: Approaches to Fieldwork
- ▶ Ethnoarchaeology: Building Frames of Reference for Research

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Ethnomuseology

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"Ethnomuseology" is a relatively new term that refers to the emerging knowledge and use of culturally-appropriate forms of curation and conservation of objects and archival materials that

incorporate traditional care methods and protocols associated with their cultural, religious, or spiritual significance. It is informed by the knowledge systems, world views, religious beliefs, or spiritual values of the source communities, the people who are the users of cultural materials, descendants of the original users, or religious adherents or devotees. These objects and archival materials may be held in secular mainstream or public museums, in museums or cultural centers operated by Indigenous, ethnic, or religious communities, or traditional storage facilities such as Australia Aboriginal Keeping Places.

There are few references to the term "ethnomuseology" in museological literature prior to 2000. Early uses of the term ethnomuseology in the 1980s and early 1990s referred in general terms to the curation and conservation of ethnographic materials – those materials that were considered to be from "non-Western," "foreign," or "other" cultures, as opposed to the material culture of dominant, European cultures which was classified by subdisciplines such as local or social history, art, archaeology, and so on. Despite the application of the term ethnomuseology to this specific area of museum collections, there was little to differentiate the curation and display of ethnographic material from any other types of museological practice, other than an emphasis upon the conservation of organic materials, from which many ethnographic objects are made.

During the twentieth century, evolving anthropological studies in contemporary societies across the world led to the emergence of culturally diverse forms of many disciplines, such as ethnobotany, ethnoastronomy, ethnomusicology, ethnomathematics, and ethnoarchaeology. The use of the prefix "ethno," from the Greek word "ethnos" meaning "people," indicates culturally diverse aspects of a discipline. The development of these subdisciplines emphasizes the shift toward more inclusive practices that incorporate emic perspectives rather than relying primarily upon the etic, and which have resulted from decolonization and diversification of academic research methods, increasing collaboration between researchers and communities and an increase in the number of Indigenous people entering disciplines such as archaeology, anthropology, history, and museology.

Recognizing the intangible and spiritual dimensions of objects, and the importance of the cultural values and beliefs that accord them meaning within source communities, has been changing heritage management, museum curation, and conservation practices over the past 40 years. Contemporary use of the term ethnomuseology moves from the etic approach of curating ethnographic collections within a Western frame of knowledge to an emic approach which perceives museological praxis as situated knowledge informed by, and culturally-appropriate to, the values, meanings, and protocols attached to cultural materials by the communities from which objects originate. It is based on recognition that knowledge is a social construction and that the values, meanings, and methods of care of cultural heritage are diverse. Even though a concept develops as a global phenomenon, it is adapted, reinterpreted, and manifest in local forms according to the system of knowledge in any particular cultural setting.

In practical terms, ethnomuseology refers to the inclusion of emic perspectives in the management, conservation, and curation of cultural heritage and museum collections and is often most relevant to objects and practices that have religious, spiritual, sacred, or ceremonial significance. It reflects the intangible aspects of heritage that illuminate the meaning of objects and provide context by highlighting their relationship to people and other, intangible aspects of culture. It is an approach that recognizes the authority of traditional owners, their knowledge systems, and religious perspectives and affords artifact care and respect according to traditional protocols that reflect historical and contemporary cultural associations, religious expression, and concepts of the sacred. It is part of the new museology which has seen changes in many aspects of museum work.

Approaches to care and conservation of objects in museums have shifted from the purely physical aspects to concern for also understanding and responding to intangible dimensions and the concerns of traditional custodians. Museum curators and conservators are now more likely to involve

members of source communities or faith groups in establishing and applying protocols and traditional methods required for the culturally-appropriate care of objects, especially those of religious, sacred, or ceremonial significance. In some institutions and some countries, shared custodianship is now accepted. The museum conservator's work has developed to be much more than purely scientific and technical; it is also concerned with using methods that preserve the integrity of religious or spiritual dimensions and help to maintain links between the cultural materials, the communities from which they originate, and the associated cultural expressions and activities.

Definition

Ethnomuseology involves the application of culturally-appropriate and culturally-sensitive methods of collection management, curation, and conservation that draw upon customary methods used within a particular cultural or religious setting or faith and apply these to objects in museums, cultural centers, and other collecting institutions devoted to preserving cultural heritage materials and, in the case of museums, to display and interpretation. It may be applied in museums by curators and conservators working in consultation with representatives of a specific cultural or religious group and is also practiced by community members who are adopting museum-based collection management methods to care for cultural heritage in community settings (Simpson 2002; Clavir 2003; Kreps 2003; Pepper Henry 2004; Clavir and Moses 2015).

Conventional museum conservation has been based upon standardized methods related to the materiality of objects and informed by Western scientific principles and methods. Ethnomuseology is a context-specific approach that draws upon community-based conceptions of cultural heritage management, care, and preservation, by applying customary methods and protocols of handling, access, and care. These are determined primarily by the intangible dimensions of objects – the values, beliefs, functions, meanings, significance, relationships, authority and power that the objects hold for traditional owners, and the protocols that are associated with objects. In many cases, the protocols are associated with sacred, ceremonial, or religious artifacts, or objects that are considered to have innate power or to be animate beings, and the culturally determined forms of care may be considered to be providing spiritual care (Haakanson and Steffian 2004; Schorch and Hakiwai 2014).

As culturally determined methods, they vary according to the beliefs, customs, and practices of the specific source community, traditional owners, and religious community from which the object originates. This avoids the application of rigid Eurocentric disciplinary practices and allows for flexible approaches to curation and conservation practices that balance conventional scientific methods with those that reflect the cultural and spiritual values of local communities.

Historical Background

Ethnomuseological practices began to evolve in the 1980s and 1990s, reflecting changing attitudes toward heritage and culture. Decolonization, cultural diversity and inclusivity, the role of heritage in maintaining a sense of identity, and the need for the protection of cultural heritage in all its forms became key issues in the forum of the United Nations and the subject of many international academic and professional organizations and conferences. This followed over a decade of increasing protests by Indigenous peoples and minority groups on many issues relating to civil and human rights; part of the broader civil rights movement in western nations, particularly the USA and Australia; and the global movement toward the dismantling of the legacies of colonialism and imperialism.

The concerns of Indigenous peoples are related to a wide range of issues including land rights, exploitation of natural resources, self-determination, religious freedom, and intellectual property rights. In regard to cultural heritage management, their concerns related to the activities of archaeologists and anthropologists – in particular the excavation of burial sites and the collection of

human remains and sacred objects for research purposes – and to practices of museums which displayed items inappropriately interpreted Indigenous cultures and historical events from the perspective of Western historians and curators and claimed legal ownership of materials removed from source communities, including items that are required for religious practices.

In the USA, archaeological sites became a focus for protests by Indigenous peoples who highlighted the differing treatment that was accorded to the burial sites and remains of Indigenous peoples in comparison with those of Western people. They called for greater respect of their religious and spiritual beliefs and values and respectful treatment of ancestral remains. Members of the American Indian Movement, the International Indian Treaty Council, and the Native American Rights Fund began actively opposing archaeological practices, demonstrating against the excavation of Indian burial sites, research on human remains, and the public display of human remains in museum exhibitions and in archaeological heritage sites.

There were complaints from source communities concerning the loss of cultural heritage and its holding in museums, emphasizing ongoing links between people and their cultural heritage and the effects of its removal from source communities. Objects were often in collections far from source communities and therefore largely inaccessible, and in many instances their presence in collections was unknown to source communities. They challenged the authority of western historians and museum curators to control the interpretation of their histories and cultures and criticized the inappropriate handling and display of culturally-sensitive materials such as sacred, ceremonial, or restricted objects and information and the practices of museum conservators and curators which were based upon Western scientific principles that preserved the materiality but failed to recognize religious and cultural significance and spiritual dimensions. As communities gained knowledge of the extent and location of museum holdings, some requested the repatriation of materials. Responses from museums were usually to refuse such requests, with arguments based on claims that objects had been legally acquired and were therefore owned by the museum.

Changing perceptions of cultural heritage and the rights of source communities were becoming a focus for meetings that brought together participants from across the world, highlighting the importance of cultural diversity and new approaches to heritage protection as global concerns. Dialogue among Indigenous peoples at an international level led to the production of statements asserting cultural identity and calling for recognition of Indigenous rights, including the *Kari-Oca Declaration* (1992), *The Indigenous Peoples' Earth Charter* (1992), and the *Mataatua Declaration on Cultural and Intellectual Property Rights of Indigenous Peoples* (1993). These – and other statements by Indigenous peoples – emphasized the need for the protection of and access to traditional lands and sacred sites, reflecting the links between peoples, place, culture, and identity. The intangible and spiritual aspects of heritage were common themes in these statements, increasingly being framed within discourse concerning religious freedom, intellectual property rights, and other human rights issues.

The Mataatua Declaration on Cultural and Intellectual Property Rights of Indigenous Peoples is one of the most significant Indigenous Statements concerning cultural property rights. The Declaration asserts that "Indigenous Peoples of the world have the right to self determination, and in exercising that right must be recognized as the exclusive owners of their cultural and intellectual property." It arose out of discussions among delegates at the First International Conference on Cultural and Intellectual Property Rights of Indigenous Peoples held in Whakatane, Aotearoa, New Zealand, in June 1993. The Declaration called for states and national and international agencies to develop policies and practices that "Recognise that indigenous peoples are the guardians of their customary knowledge and have the right to protect and control dissemination of that knowledge."

The issues concerning intangible heritage and spiritual aspects of culture are part of a broader discourse concerning Indigenous cultural and intellectual property rights and the roles played

by archaeologist, anthropologists, and museum anthropologists in acquiring cultural materials and controlling their interpretation. A number of references were made to cultural property and museums in the 1993 Mataatua Declaration on Cultural and Intellectual Property Rights of Indigenous Peoples. It emphasized the inadequacies of existing mechanisms for protecting the Intellectual and Cultural Property Rights of Indigenous Peoples; established the actions and protocols that are expected of museums holding collections of Indigenous human remains, funerary items, and cultural objects; and proposed that such materials held in museums should be offered back to their traditional owners.

Indigenous peoples became active participants in international dialogue through the actions and programs of international organizations such as the United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Council on Monuments and Sites (ICOMOS), and the World Archaeological Congress (WAC). Their involvement reinforced the need for archaeologists, museum anthropologists, conservators, and others involved in cultural heritage management to recognize Indigenous rights and employ respectful practices, a process that can be seen as decolonization of archaeology and the museum and which required some significant changes in western concepts of heritage.

The conflict over archaeological sites, human remains, and cultural property induced re-examination of the roles and changing relationships between anthropologist, archaeologists, museum anthropologists, and Indigenous peoples. The World Archaeological Congress (WAC) held an Inter-Congress at Vermillion, North Dakota, in 1989 to debate the issues of "Archaeological Ethics and the Treatment of the Dead." It brought together individuals and groups with a diverse and opposing range of views about the importance of scientific research and the cultural, religious, and spiritual rights of Indigenous peoples and included a significant number of Indigenous participants. While it highlighted the extent of divided opinions, even among archaeologists and other scientists, it resulted in the adoption of the Vermillion Accord on Human Remains, by WAC in 1990. This landmark agreement called for respectful treatment of the dead and for the wishes of the dead concerning disposition. In 2006, the Tamaki Makau-rau Accord was adopted by the World Archaeological Congress and extended similar principles to display of human remains and sacred objects, establishing the requirement for members to consult with and seek permission from associated communities before displaying such materials in any form.

Intangible Heritage and Spiritual Values

Definitions of heritage have undergone significant changes over the past 40 years, particularly in terms of understanding the diversity of values and concepts attached to both cultural and natural heritage, the importance of intangible heritage and its role in giving meaning to objects and places, and the relevance of cultural heritage – in all its forms – to contemporary cultures. In particular, recognition of the importance of intangible heritage and the diverse manifestation and expressions of culture that are attached to objects have highlighted the importance of relating heritage management to people, understanding the complex histories and relationships associated with heritage, and recognizing the cultural and spiritual rights of communities to have define and control their cultural heritage.

Cultural values and the importance of intangible dimensions of heritage have become key aspects of the discourse surrounding heritage, its importance to communities, and the need for measures to protect it in all its forms (Alivizatou 2012). This is reflected in various international agreements and programs related to heritage and cultural diversity. These include revisions to the 1972 Convention on World Cultural and Natural Heritage to include cultural landscapes; the Australian ICOMOS Charter for the Conservation of Places of Cultural Significance (known as the Burra Charter) in 1979, with revisions in 1999; the Mexico City Declaration on Cultural Policies in 1982; the UNESCO Recommendation on the Safeguarding of Traditional Culture and Folklore in 1989; the UNESCO Programme of the

Proclamation of Masterpieces of the Oral and Intangible Heritage of Humanity (1998); the Vermillion Accord in 1990; the Nara Declaration on Authenticity in 1994; the Tokyo Declaration on Cultural Diversity and Heritage in 2000, the UNESCO Universal Declaration on Cultural Diversity (2001), the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003), the UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005), the Faro Convention on the Value of Cultural Heritage for Society (2005), and the United Nations Declaration on the Rights of Indigenous Peoples (2007).

The UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (UNESCO 2003) emphasized the dynamic nature of intangible heritage and its importance for cultural continuity and diversity, referring to it as "living cultural heritage." The Convention sets out objectives relating to the documentation, preservation, and protection of intangible heritage with the participation of source communities, while "respecting customary practices governing access to specific aspects of such heritage" (Article 13 (d) (ii)). State parties are required "to ensure the widest possible participation of communities, groups, and where appropriate individuals that create, maintain and transmit such heritage and to involve them actively in its management" (Article 15).

These principles were central concepts in the drafting of the United Nations Declaration on the Rights of Indigenous People (UNDRIP), which was adopted by the UN General Assembly in September 2007 (United Nations 2007). The Declaration states that:

> Indigenous peoples have the right to practise and revitalize their cultural traditions and customs . . . to maintain, protect and develop the past, present and future manifestations of their cultures, such as archaeological and historical sites, artefacts, designs, ceremonies, technologies and visual and performing arts and literature. 2. States shall provide redress through effective mechanisms, which may include restitution, developed in conjunction with indigenous peoples, with respect to their cultural, intellectual, religious and spiritual property taken without their free, prior and informed consent or in violation of their laws, traditions and customs. (Article 11)

> Indigenous peoples have the right to manifest, practise, develop and teach their spiritual and religious traditions, customs and ceremonies; the right to maintain, protect, and have access in privacy to their religious and cultural sites; the right to the use and control of their ceremonial objects; and the right to the repatriation of their human remains. (Article 12)

In the UN Declaration on the Rights of Indigenous Peoples and other statements, the United Nations Permanent Forum on Indigenous Issues and the UN Human Rights Council have continued to exhort states and museums to develop mechanisms to facilitate access to and repatriation of ceremonial objects and human remains at national and international levels and recommended that governments should provide funding for these purposes.

Indigenous people continue to seek ways in which they can fully participate in the management and protection of their heritage, tangible and intangible, through various means. The emphasis upon intangible heritage and the importance of cultural heritage to living peoples has become an important component of international discourse concerning heritage research and management.

Museums and intangible heritage was the theme for the International Council of Museums' (ICOM) annual meeting held in Seoul in 2004, providing an opportunity for museum staff from across the world to discuss ways in which museums might face these new challenges. In the past, those involved in archaeology, museums, and other areas of heritage management were primarily concerned with the tangible aspects of culture, the physical evidence associated with artifacts, artwork, buildings, and monuments. The growing emphasis on intangible aspects of culture challenged the existing notions of heritage shifting the emphasis from past cultures to consideration of contemporary peoples and living cultures and from a focus on the materiality of tangible heritage to growing interest in the associated values, beliefs, and cultural expressions. For collecting institutions this presents significant changes, requiring new ways of perceiving the role of the museum and the methods of its practice, which present both challenges and opportunities for understanding Western cultures as well as non-Western (Alivizatou 2012).

The emergence of the concept of spiritual heritage also presents a challenge for museums, which have traditionally been secular spaces. Yet, in many ways it is the spiritual dimensions of heritage that are most significant in the development of ethnomuseology, both in terms of recognition of the significance of the spiritual significance and also in relation to the methods required to address spiritual heritage needs in the museum. Spirituality is an important part of the process of decolonization and Indigenous self-determination. As Māori academic Linda Tuhiwai Smith emphasizes:

> The values, attitudes, concepts and language embedded in beliefs about spirituality represent, in many cases, the clearest contrast and mark of difference between indigenous peoples and the West. It is one of the few parts of ourselves which the West cannot decipher, cannot understand and cannot control. (Smith 2000: 74)

Museum Policy Developments

Although these developments were part of a worldwide movement by peoples asserting their cultural identity, heritage claims, and intellectual property rights, Māori, Indigenous Australian, Native American, and First Nations peoples were among the most vocal in criticizing Western science, research, and museum practices. Consequently it is in the settler societies of New Zealand, Australia, Canada, and the USA that the most significant signs of change in heritage research and management policies have taken place at a national level. Significant legislation or policies relating to Indigenous peoples and their cultural heritage in museums were introduced in each of these countries in the early 1990s, although it should be noted that some museums were already working closely with Indigenous peoples and implementing innovative programs prior to that. While the legislation and policies are based upon recognition of cultural heritage rights and the intangible dimensions of culture that provide the context and meaning for objects, none of these countries are states parties to the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage.

In the USA, two pieces of legislation had significant and far-reaching effects on museums holding collections of Native American materials. The National Museum of the American Indian Act (1989) established a new National Museum of the American Indian (NMAI) comprising the former Museum of the American Indian, Heye Foundation in New York (now the George Gustav Heye Center), the new museum on the Mall in Washington, D.C., and a Cultural Resources Centre for the collections. The Act also established responsibilities for the NMAI to address issues concerning ownership and repatriation of ancestral remains, funerary items, and sacred objects originating from Native American and Native Hawaiian communities, and the 1990 Native American Graves Protection and Repatriation Act (NAGPRA) applied the same requirements to all other federally funded museums in the USA. Museums were to generate inventories, inform tribes of holdings, and respond to any repatriation request by considering the rights of claimants, a process requiring museums to consult with source communities. This dialogue has enhanced understanding within the museum sector of the customary laws associated with sacred and ceremonial objects and highlighted the diversity of traditional care methods applied by different tribes to objects that might seem similar.

The building of the National Museum of the American Indian (NMAI) in Washington, D.C., created various mechanisms for engagement between the Museum and Native American communities in fulfillment of its mission of enhancing the development, maintenance, and perpetuation of Native culture and community. It also provides some of the most extensive and well-documented examples of ethnomuseology in practice. In addition to collaborative research and exhibition development, the vast collections of cultural materials are held in the Cultural Resources Centre (CRC) in Suitland, Maryland, where they are stored, managed, catalogued, and conserved. As part of the architectural planning of the CRC, consultants were hired to assess the space and storage needs that would be required to ensure that traditional care methods could be accommodated in the facility. While recognized that far more extensive

consultation would be required, the report identified three significant areas that needed to be addressed: that objects are alive and must be handled with respect; taboos and restrictions, including those based on gender, must be respected; and respectful treatment may require specific positioning (Cited in Rosoff 2003: 77–78).

After the CRC opened, information about customary care often resulted from discussions with Native delegations visiting the CRC on matters related to repatriation. Many of these relate to the religious and spiritual beliefs associated with sacred and ceremonial objects and illuminate the relationship between the objects and the related forms of intangible heritage, such as dances and rituals. Every tribe has different requirements, and extensive consultation with diverse tribal groups is required – it is a long-term and ongoing process. Native American staff members, frustrated with the slow progress of gathering information, formed an informal Traditional Care Committee in 1995 (Rosoff 2003: 78). Over time, tribal consultations resulted in the compilation of a large body of information regarding the values and protocols attached to objects and the preferred methods of traditional care. The extent and diversity of the information required the development of a database to ensure that the 300+ staff members involved in collection management had access to the information. The database provides layered levels of access, further reflecting Indigenous requirements for knowledge management and the protection of aspects that are restricted (Pepper Henry 2004).

The outcomes of NAGPRA have been profound in terms of its impact across the museum sector. The research and consultation required by museums to fulfill the requirements of NAGPRA has illustrated the intertwined histories of objects and the multiple meanings that they hold and how the concerns of museums and Indigenous people can be merged in heritage management practices informed by cultural values and traditions. The NAGPRA claims process has provided many examples that demonstrate the significance that sacred and ceremonial objects can have for contemporary peoples and the important role that access to or repatriation of such items can play in cultural revitalization.

Nearly three decades later, attention to intangible dimensions of cultural heritage and consultation with traditional owners are recognized necessities for museum conservation to ensuring that the integrity of museum objects is preserved (Clavir 2003). The changes are clearly evident in some institutional policies such as the *Guidelines for the Spiritual Care of Objects* at the Alutiiq ***Museum*** and Archaeological Repository in Kodiak, Alaska. Spiritual care is central to the museum's role as "a modern-day steward of ancestral objects." According to Alutiiq belief, "everything in the universe [. . .] has a *sua*, human-like consciousness, and therefore requires special care." This is achieved "by combining the best Western conservation techniques (for physical stability) with practices that reflect Alutiiq values (for spiritual care). . . . When treated appropriately, Alutiiq artifacts cease to be historical curiosities. . . .Culturally-appropriate care reunites the objects with their cultural context, honors their *sua*, and gives the objects life . . . by honoring the cultural perceptions that existed when artifacts were made, we maintain their integrity in the modern world" (Haakanson and Steffian 2004: 1).

In contrast to the legislative direction taken in the USA, the rights of Indigenous people in relation to museum collections in Australia and Canada are promoted by policies developed by the peak museum organizations, which provide guidelines for museums but are not enforceable by law. In 1989, the Canadian Museums Association established a Task Force on Museums and First Peoples which undertook extensive consultation within the museum sector and with First Nations communities, resulting in a report "*Turning the Page: Forging New Partnerships between Museums and First Peoples"* (Hill and Nicks 1992). It emphasized the need for museums to recognize the cultural heritage rights of Canada's First Nations peoples and develop processes for involving them in management and interpretation. A broad-ranging report of the Royal Commission on Aboriginal Peoples also addressed cultural heritage issues and reinforced the importance of cultural heritage to maintaining the unique identities of Aboriginal peoples and contributing to cultural continuity. Museums were again urged to collaborate with Aboriginal communities.

Cultural property issues have been included in Treaty negotiations, in some cases resulting in repatriation. The enactment of the First Nations Sacred Ceremonial Objects Repatriation Act by the Government of Alberta related specifically to Blackfoot sacred objects in the collections of the Provincial Museum of Alberta and the Glenbow-Alberta Institute in Calgary (aka Glenbow Museum). The bundles are sacred objects that are intrinsic to traditional knowledge transfer and are cared and used in the community context according to strict protocols. For some years prior to this legislation, both museums had been lending medicine bundles to bundle keepers for use in ceremonies (Conaty 2008). The legislation provided a mechanism for the repatriation of sacred objects, if they are essential to the practice of ceremonies, and paved the way for their permanent return to the Blackfoot.

In Australia, some major museums, such as the South Australian Museum, the Australian Museum, and the National Museum of Australia, began undertaking consultations with Indigenous communities in relation to Aboriginal Australian ancestral remains and sacred and ceremonial objects as early as the 1980s. Over the next few years, they developed policies that are specifically related to these collections and included removing ancestral remains from display, undertaking research into collections to identify descendant communities and the traditional custodians of sacred objects, engaging in discussions with the appropriate community members concerning future care or repatriation, applying traditional care methods, and restricting storage facilities in the museums (e.g., see Sullivan and Edwards 2004: 185–206; Kaus 2008).

These early initiatives were initially driven by a small number of museum anthropologists and Indigenous staff who were committed to changing the relationship between museums and Indigenous people. The UNESCO Regional Seminar on the Role of Museums in Preserving Indigenous Cultures, held in Adelaide in 1978, was a significant event which provided a venue for museum anthropologists and Indigenous Australians to meet and present their views on museums and Indigenous collections. This was followed in 1979 by the inaugural meeting of the Conference of Museum Anthropologists. It attracted museum anthropologists and community representatives from across Australia, as well as New Zealand, Papua New Guinea, and New Caledonia (Stanton 2011).

In 1993, *Previous Possessions, New Obligations*, a national policy to guide museums in developing their relationships with Indigenous Australians, was launched by the Council of Australian Museums Associations. It was adopted in the same year as a key policy of the newly formed national body, Museums National Inc. (now Museums and Galleries Australia), and then revised as Continuing Cultures, Ongoing Responsibilities in 2005, following a review and consultation process (Sullivan et al. 2003; Museums Australia 2005). The guidelines recognize the moral rights and customary laws of Aboriginal and Torres Strait Islanders (ATSI) with respect to their cultural heritage and provide direction for all Australian museums that hold collections of ATSI cultural materials, encouraging the establishment of institutional policies and procedures to better address the cultural heritage rights of Indigenous Australians.

Evaluation of the implementation of *Previous Possessions, New Obligations* (PPNO) found that the guidelines had been effective in museums in a number of aspects, particularly in recognition of the primary rights of Indigenous people to control their cultural material in museum collections and encouraging collaborations. It noted that implementation was primarily in major museums, however, rather than in the many small museums in regional and remote areas, that are often volunteer-run (Sullivan et al. 2003). The review identified areas that still needed particular attention, in particular to ensure that more Indigenous people were employed in museums and served on boards, and that protocols relating to Indigenous Australian cultural materials were extended to include collection management in libraries and archives and were also applied to digitized collections and documentation.

In parallel with the activities of individual museums and the development of national professional guidelines by Museums Australia, the Cultural Ministers Council introduced and funded the Return of Cultural Property Program (1993–1997).

This developed into the ongoing Return of Indigenous Cultural Property (RICP) Program, introduced in 1999–2000. The program applies only to Aboriginal and Torres Strait Islander ancestral remains, secret sacred objects, and associated materials in the collections of the National Museum of Australia and the state and territory museums (eight museums in total). The Program provides funding for museums and communities with the aims of identifying the origins of all ancestral remains and the rightful custodian(s) of secret/sacred objects, according to Aboriginal and Torres Strait Islander law. The RICP National Principles reiterate those of Continuing Cultures, Ongoing Responsibilities and stipulate that "ancestral remains and secret sacred objects will be returned unconditionally" if requested by the source community (Cultural Ministers Council).

If communities prefer that museums retain the objects, ownership is transferred to the community custodians while the objects remain in the museum, sometimes in a separate area called a Keeping Place (Simpson 2007). According to the RICP Principles:

> Storage and access to secret sacred collections shall be informed by Aboriginal and Torres Strait Islander law. Men's sacred objects must be separated from women's sacred objects, with neither to be accessible to the public … Access to secret sacred collections shall be limited to the traditional custodian/s, their representatives and designated officers with the appropriate authority. (Cultural Ministers Council n.d.)

The principles also state that "it is important that museums offer communities support for the care of returned material. This is particularly relevant to secret sacred objects." This includes offering advice or providing training "in areas such as conservation, preservation and collections management wherever possible." Materials repatriated to traditional owners are often housed in community storehouses, Keeping Places, and cultural centers where sacred and ceremonial objects and other culturally-sensitive objects and archives can be preserved, protected, and used, in ways that draw upon a combination of customary care and Western conservation (Simpson 2007; Wallace and Akerman 2008; Stanton 2011).

Until the 1980s, cultural material in museums in New Zealand had been controlled and interpreted by curators with little involvement of Māori, and museums had been "largely mono-cultural and unwelcoming to Māori" (Hakiwai in Schorch and Hakiwai 2014: 194). Now the enduring relationship of Māori people to *taonga* (cultural treasures) is recognized and forms the basis for shared custodianship in museums. Māori cultural values, knowledge, and *tikanga* (customs) are applied in decision-making concerning the treatment and care of *taonga*, and Māori are actively engaged with museums in various capacities, including hiring of staff and collaborative strategies for local iwi to be involved as custodians and interpreters (Clavir 2003, McCarthy 2011; Tapsell 2012; Schorch and Hakiwai 2014).

Changes in relationships between museums and Māori have been attributed to the political climate in New Zealand in the 1980s and *Te Māori,* a major exhibition of Māori cultural material that toured the USA and New Zealand from 1984 to 1987. It was described by Arapata Hakiwai, a Māori scholar and museum specialist, as "the result of a groundbreaking collaboration and co-operation between museums, government agencies, sponsors and Māori people." In Hakiwai's view, one of *Te Māori's* legacies was the acknowledgement and recognition of cultural ownership:

> *Te Māori* was transformational and it awoke the spirit of our ancestors on distant shores and stirred the imagination and minds of those working in museums. Its influence and legacy has been profound. It changed the lives of people and museums, it involved our people in ways never before undertaken, and it said to the world here are our taonga and we are its people. The world saw the magnificence of our art traditions and the presence of our people and our rituals and *tikanga* (customs). People saw that there was a *living* relationship between the *taonga* and their descendant kin communities. (Hakiwai in Schorch and Hakiwai 2014: 196.

When the National Museum of New Zealand Te Papa Tongarewa (Te Papa) was created by an act of parliament in 1992, biculturalism was conceived as the basis for its governance, management structure, and operation and the inclusion of an active marae within the museum, *Te Marae o Te Papa Tongarewa*. The concept of Mana Taonga

was a central principle in planning Te Papa. It recognizes Māori people's "spiritual and cultural ownership rights conferred through the *whakapapa* in respect of the traditions and histories that taonga represent, as well as the *whakapapa* of the creator of the *taonga"* (Cited in Schorch and Hakiwai 2014: 205). Hakiwai describes it as "a dialogue between Indigenous Māori practice and Western theory leading to a refined understanding of performative democracy within a museum as forum, or public sphere" . . ."In a practical sense Mana *taonga* provides iwi and communities with the right to define how *taonga* within Te Papa should be cared for and managed in accordance with their *tikanga* or custom" (Hakiwai in Schorch and Hakiwai 2014).

Although initially perceived as a successful model, the effectiveness of biculturalism Te Papa has been questioned by some observers including academic Paul Williams, whose critique of the bicultural practices of Te Papa identified problematic aspects in the interpretation strategies and in compromises made in relation to the protocols normally applied to a marae and meeting house (Williams 2005).

Museum Conservation

Since the 1980s, there has been growing interest among individuals and professional organizations in the subject of customary care methods and their application within museums. This is reflected in the number of specialist professional meetings and conferences that have specifically examined the care of religious, sacred, and ceremonial objects. Papers focusing upon the subject were presented at annual conferences of national and regional museum and conservation organizations and published special issues of journals such as the Journal of the American Institute for Conservation (JAIC) and the Western Association for Art Conservation Newsletter and in conference proceedings.

The Canadian Conservation Institute held a symposium in 1986 examining the care and preservation of ethnological materials (Barclay et al. 1988). The Plains Indian Museum's Ninth Annual Plains Indian Seminar, in the USA, examined The Concept of Sacred Materials and Their Place in the World (Horse Capture 1989). In 1991, the 19th Annual Meeting of the American Institute for Conservation considered the topic of Conservation of Sacred Objects and published several papers in an issue of the journal devoted to the subject (American Institute for Conservation 1992). The Conservator's Approach to Sacred Art was the subject of a special issue of the Study Series of the ICOM-CC and was published in the Western Association for Art Conservation Newsletter (Heikell et al. 1995). In 1994, a special conference was organized by the Canadian Museum of Civilization (now known as the Canadian Museum of History), the Commonwealth Association of Museums, and the University of Victoria, and papers were presented in *Curatorship: Indigenous Perspectives in Post-Colonial Societies* (Canadian Museum of Civilization & University of Victoria 1996). In 2001, the Religion and the Arts Initiative at the Center for the Study of World Religions, at Harvard University, convened a conference to examine issues associated with religious objects in museums, entitled "Stewards of the Sacred: Sacred Artifacts, Religious Culture, and the Museum as Social Institution" (Sullivan and Edwards 2004).

Many of the contributions to these discussions relate to cultural materials that originate from North America, Australia, and New Zealand, and authors were often conservators and curators who worked in institutions, such as the National Museum of the American Indian, the University of British Columbia, and the National Museum of New Zealand Te Papa Tongarewa, who had taken a lead in creating more consultative and collaborative relationships with source communities. There were also some conservators who were concerned with the application of religious protocols that apply to objects from other cultures including Jewish, African, and Tibetan Buddhist religious objects and materials (see article by Greene, Mellor, and Reedy 1992 in American Institute for Conservation 1992).

Over the past 15 years, international meetings of conservators have extended the discourse and literature into other cultural arenas including Africa, Asia, and the Pacific (Jones 2003; Kreps 2003;

Stovel et al. 2005). In 2003, the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) in Rome, Italy, held a forum to discuss "Living Religious Heritage: conserving the sacred." A conference in Munich, organized by the International Institute for Conservation of Historic and Artistic Works in 2006, examined The Object in Context: Crossing Conservation Boundaries. The Canadian Conservation Institute held an international symposium in 2007, which brought together Indigenous people and professional conservators to discuss "traditional, technical, ethical and intangible aspects of the conservation of Indigenous material culture," and following this produced a publication of papers (Dignard et al. 2008). The Committee for Conservation of the International Council of Museums (ICOM-CC 2008) devoted its 15th Triennial Conference in India in 2008 to the subject of Diversity in Heritage Conservation: Tradition, Innovation and Participation.

The ICCROM forum in Rome, "Living Religious Heritage: conserving the sacred," brought together international conservation specialists from many countries in discussion of museum collections and heritage sites of religious and sacred significance. The presentations provided examples from various parts of the world and from major faiths as well as Indigenous cultures. These included papers discussing the conservation of Jewish sacred materials according to the strict requirements of Jewish Law codified in the Halacha (Maggen 2005) and the introduction in the Islamic Arts Museum Malaysia of collection management practices based upon Islamic values (Zekrgoo and Barkeshli 2005).

Ethnomuseology in Practice

In the application of ethnomuseology, Western museum methodologies and philosophies of care and preservation established over the past 100 years and more are applied in parallel with cultural protocols of care and use which have been practiced and evolving within the originating communities or faith groups for hundreds or thousands of years.

The international interest in cultural heritage rights and integrated methods of collection management and other museological roles has also influenced community approaches to heritage management. Ethnomuseological practices are now used in the care of objects in museums in many contexts, not just museums holding ethnographic collections but also community-run facilities, such as Aboriginal Australian Keeping Places, community museums, and cultural centers in North America and the Pacific (Simpson 2001, 2007; Clavir 2003; Kreps 2003; Alivizatou 2012).

It is part of a two-way process in which museums are adopting cultural practices from traditional custodians, and communities are adopting and adapting museum practices to assist them in achieving their cultural heritage preservation goals. These include preserving tangible and intangible heritage, reconnecting objects with people and associated activities, as well as engaging in cross-cultural dialogue with non-Indigenous people by taking control over the display and interpretation of material culture, where it is appropriate to do so.

Reflecting the specifics of the local community, these are highly varied in form, including models based upon sacred storehouses found in various locations in Indonesia and the Pacific; Keeping Places used in Aboriginal communities to safely store secret-sacred objects; tribal museums and cultural centers in North America; wat or monastery museums in Thailand; and temple museums in India. In these varied settings, ethnomuseology is evident in the adoption by culturally diverse peoples of Western conservation and other museological functions, applied within the Indigenous knowledge framework, so replacing the traditional Eurocentric model of the Museum with new, culturally specific models. What is important is the emic perspective that is applied to the museological processes reflecting cultural, spiritual, and ethnoscientific principles of direct relevance to the original cultural context of specific objects.

Traditional care methods are being incorporated into museum practices by staff in many museums in North America, Australia, New Zealand, and in other countries. There are also many more Indigenous people working in the cultural heritage sector

in fields such as archaeology, anthropology, and museum curation and collection management. The emic nature of their cultural knowledge and perspectives can create opportunities for invaluable new approaches to research, preservation, and interpretation and for democratization of the museum. Their direct relationships to communities can open new avenues for museum-community engagement. The intangible and spiritual aspects of cultural heritage with which they have practical and authentic cultural knowledge inform their practice and provide clear examples of the significant changes that are occurring in heritage management in museums (Rosoff 2003; Haakanson and Steffian 2004; Pepper Henry 2004; Kaminitz and West 2009; Tapsell 2012; Schorch and Hakiwai 2014). While museums such as the NMAI and Te Papa have featured prominently in professional and academic literature, there are many other museums in which Indigenous staff have contributed to the evolution of ethnomuseology, and the inclusion of intangible and spiritual aspects of heritage have become integral aspects of the care and interpretation of tangible heritage.

Storage and Display

Storage and display of sacred objects can include specific positioning. Statues of the Buddha should be handled and stored respectfully. They should never be placed on the floor, as it is considered unclean, and when placed in storage or on display, the Buddha's head should be higher than surrounding objects.

Jim Pepper Henry, formerly the Repatriation Program Manager at the National Museum of the American Indian, has listed a number of traditional care constraints that are frequently requested by representatives of American Indian tribes, including requests for sacred objects to be positioned with a particular orientation, placement on higher shelves, the use of wooden shelving, and the separation of culturally-sensitive materials from other objects or from materials from other tribes. There are also requests to ensure that sacred bundles are not opened and disassembled and that ceremonial pipes are stored with the bowl disconnected from the stem (Pepper Henry 2004).

As part of the care provided in Alutiiq Museum combining Western conservation and Alutiiq spiritual care, "Like Alutiiq people of all eras, we use the best technologies available in ways that are uniquely Alutiiq. For example, we store stone lamps in seats of archival-quality foam on non-off gassing, baked enamel, space-saver shelving, but they are stored upside down, a practice that keeps their spirits from departing" (Haakanson and Steffian 2004).

Continued Use of Objects

In the interests of preservation and conservation, conventional museum practices protect objects from handling and use. In some cultures, however, the continuing authority and efficacy of ceremonial objects or those with spiritual power may depend upon people using and performing them. To facilitate this, some museums have lent objects to authorized community members for use in ceremonies and other cultural activities or allowed items to be used in the museum setting. This arrangement requires conservators to balance concerns for the physical condition and preservation of the object itself, with consideration of the cultural and religious needs and rights of the community, and the growing awareness of the responsibilities that conservators now have to preserving the integrity of the objects (Clavir 1996, 2003; Jones 2003; Rosoff 2003; Conaty 2008; Haakanson and Steffian 2004; Kamintz and West 2009; Pepper Henry 2004: 111; Simpson 2001). While loans to Indigenous communities are a new consideration for most conservators, these initiatives echo long-accepted practices in Christian ecclesiastical museums and cathedral treasuries which protect and preserve precious liturgical objects, but still allow some of these to be used for worship or ceremonial functions.

Materials Used in Conservation Treatments

Islamic values applied to religious objects and documents include the need to show respect for the Quran as well as any objects on which Quranic verses or other sacred texts appear, such as garments. Conservation of both Jewish and Islamic objects must take account of concepts of the pure and impure. In both faiths, pigs are considered to

be impure so conservators are required to avoid using brushes made from pig bristle when carrying out restoration work on a holy text and to avoid the use of pig skin in materials or tools (Maggen 2005; Zekrgoo and Barkeshli 2005). Jewish law proscribes appropriate treatment of Jewish religious objects associated with a Torah scroll. This requires conservators to have received appropriate training in religious law, consequently limiting those who have the required knowledge. Maggen (2005: 106) notes that while "most of the suggested treatments would be feasible . . . [if] the conservator is not Jewish, the conservation cannot be done in conformity with a Jewish rabbinical Halacha point of view."

Restrictions on Access and Display

In some cultures, protocols require the separation of sacred objects from secular materials, or restrictions on who can view or handle sacred objects. Restricted access is one of the most common concerns relating to the management of collections of Aboriginal Australian and Native American material culture. In museums, this requires the adoption of protocols in the care of restricted materials that includes providing separate storage and restricting access, often on the basis of gender; such materials cannot be placed on display in exhibitions. Some cultures also place restrictions on women handling or having access to certain objects at a time when they are menstruating, resulting either from the idea that at this time women are impure or they may emit a power themselves which can adversely impact on sacred and ceremonial objects (Drumheller and Kaminitz 1994; Jones 2003; Pepper Henry 2004: 107; Zekrgoo and Barkeshli 2005: 102–106).

Most national, state, and university museums in Australia store secret/sacred materials in restricted areas, which may be a section of the main collection store, suitably marked and screened, or in some cases placement in a separate room, sometimes referred to as a Keeping Place. Access is restricted to the community custodians and to curatorial staff who have been given the authority to view such items.

Some Native American and First Nations communities have requested that museums do not display certain sacred objects, such as Plains Indian medicine bundles and kachina figures and masks of some Pueblo Indian groups of the Southwest of the USA.

The Baule of the Ivory Coast consider some carvings and masks to be inhabited by potentially dangerous spirits, and these are restricted on the basis of gender. In the exhibition "Baule: African Art/Western Eyes" (1997–1998), these were presented in their cultural context in spaces that reflected these gender restrictions. Visitors were provided with insights into the spiritual dimensions of the objects as perceived in Baule culture and the significance attached to looking, where "seeing something is potentially more significant, more dangerous and contaminating, than touching or ingesting something." Visitors were then able to decide whether or not to view them (Vogel 1997: 110).

For some communities even replicas made by museum exhibition staff may be considered sacred and inappropriate for display purposes because they have been made by people with access to sacred knowledge. The replicas may therefore embody power and knowledge that should not be revealed to those who are uninitiated (Simpson 2001: 203, 217).

The accommodation of gender-specific restrictions is not a simple matter, as these may well conflict with gender equity legislation and institutional policy. Sometimes traditional custodians are pragmatic about objects in museums and may be less rigid in applying such restrictions to staff, while still maintaining strict protocols in relation to individuals who are members of the community from which the restricted items originate. In some museums, gender restrictions are simply regarded as unenforceable and staff members are requested to voluntarily observe such protocols (Pepper Henry 2004: 111).

Rituals of Care and Protection

The performance of rituals in museums may fulfill a number of functions. Certain categories of objects, such as images of gods and deities, may be considered powerful or be seen as animate beings or living spirits and require considerations that are beyond the concerns of conventional

Western technical and scientific conservation practices. Care and preservation practices that reflect the status of these types of sacred objects may include the performance of rituals.

Those associated with spiritual care of sacred objects include ceremonial feeding by dusting with corn pollen or other materials or providing offerings of braids of sweet grass, cornmeal, feathers, sage brush, and so on. Ritual feeding can be accommodated by the museum by providing plant materials that have been treated to kill any insects that could pose risks to objects in the collection that are made from organic materials.

The National Museum of the American Indian has also received requests from community representatives for conventional museum preventative conservation treatments to be omitted. This includes extended freezing of an object, placing the object in a low oxygen or CO^2 chamber, or wrapping in a non-permeable material, treatments that they believe are potentially harmful to living objects. Pepper Henry notes that pest infestations were seen by some community representative as "part of an object's 'normal' life cycle" that should be allowed to occur. Requests such as these posed a greater challenge for museum staff when having to balance community perceptions of "cultural risks" with the need for treatments necessary for pest management that would threaten the preservation of the object as well as posing a risk to other items in the collections (Pepper Henry 2004: 108). Likewise, some Indigenous people have expressed concern that conservation results in the artificial preservation of sacred objects which would naturally deteriorate (Clavir 2003; Kreps 2003).

Ceremonies, such as blessings and cleansing ceremonies, may also be performed to purify objects, a space, or the people who enter and may be held when a new museum, gallery, or exhibition is being opened. In some religions, certain objects contain a life force or spiritual power that may require special spiritual care or maybe potentially dangerous to those coming in close contact with them (Kreps 2003: 147–148). Ritual cleansing may be required for purification or for the protection of spaces or people to contain the powers associated with objects which may otherwise be harmful to museum staff or visitors. In North America and Australia, these are usually smudging or smoking ceremonies. In Māori culture, cleansing or purification ceremonies involve ritual washing. Museums may provide facilities for use by staff and visitors entering or leaving galleries or storage areas, so that they can wash off that which is *noa* (mundane, nonsacred), of everyday life before entering an area where *tapu* or sacred items are stored. When leaving, they again wash their hands to rinse of anything *tapu*. In the working areas of the museum, this may be a sink, while galleries may incorporate washing facilities that are more aesthetically pleasing, such as the bowl of water positioned outside a temporary exhibition at Rotorua Museum, or the stone water feature at the entrance to the Māori galleries in Auckland War Memorial Museum.

The increasing emphasis upon intangible aspects of the heritage upon marks a significant change and challenge in heritage management and especially for museums, whose primary role until the late twentieth century was to preserve objects. It requires greater attention to be given to relationships between objects and the various people who have encountered them throughout their lives and to give particular consideration to the role of intangible and tangible heritage in sustaining living cultural practices and expressions. As Miriam Clavir has noted, this means a significant change in perspective for museums, requiring them to accept their new role in "facilitating the preservation of indigenous cultures through supporting their living expression rather than through preserving their material culture" (Clavir 1996: 101). She also notes that requests for certain procedures raise ethical concerns for conservators, such as when asked "to put objects at physical risk in order to facilitate the preservation of conceptual integrity or cultural significance" (Clavir 1996, 2003).

The inclusion of diverse cultural protocols in the care and conservation practices employed in museums is not without its critics. British social theorist Tiffany Jenkins has criticized the adoption of cultural protocols that conflict with conventional museum practices, such as restricting access or screening sensitive objects from view, referring to

this as "censorship." She has argued that "there should be no restrictions on the pursuit of intellectual inquiry" and asserted that "The pursuit of truth is sacrificed on the altar of veneration."

Museums are not just concerned with preserving objects of material culture or tangible heritage but have broader concerns that include preserving and communicating their cultural integrity and aspects of culture that give them meaning: the intangible forms of heritage – knowledge, skills, practices, and expressions of culture such as ceremonies, songs, stories, dances, etc. The performance of rituals and ceremonies associated with artifacts serves as a mechanism for helping to preserve the intangible forms of heritage. These practices are a means of preserving the objects, as well as showing respect for their spiritual dimensions.

Miriam Clavir observes that "It is the role of museums to research and recognize the cultural and spiritual value of objects in their care and to implement the necessary protocols for culturally-sensitive objects, allowing their collections to both present the diversity of the societies they represent and to show the respect that such diversity requires" (Clavir in Clavir and Moses 2015). As Rosoff (2003: 75) emphasizes, this is a process that is based on mutual trust requiring the establishment of long-term relationships.

Ethnomuseology enables source communities to continue to engage with objects by performing some of the associated, intangible aspects of culture; it is therefore also an active form of preservation and interpretation of intangible heritage. Jim Pepper Henry, formerly Assistant Director for Community Services at the National Museum of the American Indian, explains that having Native American priests and ceremonialist regularly perform rituals is seen as preserving and perpetuating "living culture," a central philosophy of the NMAI (Pepper Henry 2004: 105).

Jenkins has also argued that "Museum directors must not act as priests" and "idolatry has no place in museum policy" (Jenkins 2005). However, the adoption of culturally-appropriate protocols of care in museums does not require curators to perform the roles of priests, but rather to adopt respectful methods that reflect the status of religious, ceremonial, and sacred objects. Respectful treatment should not be mistaken for the act of worship. In museums in New Zealand, it is not uncommon for museum staff, Pakeha (non-Māori) as well Māori, to place a piece of green foliage in front of Māori artifacts or taonga. This is not an act of worship but a demonstration of respect by museum staff who understand the Māori view of the sacred nature of the objects, rather than seeing them merely as objects of academic interest.

> "Respect is the watchword in the care of culturally-sensitive materials in museum collections. Ideally, standards of best conservation practice work with cultural standards defined by the originating community, in this way achieving a type of care based on partnership that protects both the tangible and intangible attributes of the heritage objects." . . . "Respecting cultural protocols, though, is not asking people to believe, but asking them to respect those who do." (Clavir in Clavir and Moses 2015)

Likewise, public programs may invite visitors to observe organized ceremonies or rituals performed by priests or other qualified individuals, which can enhance their understanding of the meaning of objects and their relationships to people. Visitors are not asked to participate in ceremonies of worship, although staff and visitors may be offered the opportunity to participate in a cleansing ritual, such as smudging or handwashing. Understanding and observing cultural protocols gives greater meaning to objects by emphasizing the contexts in which objects were used and the relationships between objects and peoples.

Dialogue and collaboration between museum staff and source communities can facilitate greater understanding among curators and conservators of the contextual background of objects and their meanings and significance to contemporary source communities. Through sensitive and creative approaches to the care, display, and interpretation of cultural materials, this can also be communicated to visitors, with the potential to enhance inter-cultural understanding as a key part of the educational function of the museum.

By focusing on intangible dimensions of objects and their significance to source communities, meanings, values, and practices associated

with the objects become a central concern for those who study and manage cultural heritage. The application of ethnomuseology to religious, sacred, and ceremonial objects is of particular importance for source communities, as it marks a significant step forward in regaining rights to cultural heritage, and is a key area in which the adoption of respectful and culturally-appropriate methods can be demonstrated by museums and others involved in heritage management. It is also an area of professional practice that is rich in potential for research into the effectiveness of culturally-appropriate museum display and interpretation and its potential to build bridges between cultures.

Due to the sensitive nature of some of the objects and associate knowledge, future questions concerning ethnomuseology will no doubt focus on who undertakes research to identify the status of objects in collections and the cultural protocols associated with their care. As well, the management of that information will itself require the application of protocols to ensure that customary protocols concerning access rights are observed and applied to all types of collecting institutions including museums, art galleries, libraries, and archives.

Cross-References

- ▶ Archaeological Stewardship
- ▶ Australia: Indigenous Cultural Property Return
- ▶ Canada: Cultural Heritage Management and First Nations
- ▶ Conservation in Museums
- ▶ Convention for the Safeguarding of Intangible Cultural Heritage (2003)
- ▶ Cultural Heritage Management and Native Americans
- ▶ Cultural Heritage Management: International Practice and Regional Applications
- ▶ Cultural Heritage Objects and Their Contexts
- ▶ Decolonization in Archaeological Theory
- ▶ Ethics of Collecting Cultural Heritage
- ▶ Indigenous Archaeologies in Archaeological Theory
- ▶ Indigenous Intellectual Property Issues in Archaeology
- ▶ Intangible Cultural Heritage
- ▶ Postcolonial Archaeologies
- ▶ Tamaki Makau-Rau Accord on the Display of Human Remains and Sacred Objects (2005)
- ▶ World Heritage and Human Rights

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Europe Incastellated: Medieval Archaeology

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Introduction

The castle is perhaps the signature building of the European Middle Ages. Whether surviving as earthworks, ruined masonry or, in a minority of cases, still inhabited, castles are a testament par excellence to the ambition and achievements of the landed aristocracy that ruled Europe from the eleventh to the fifteenth centuries. The castle's origins, longevity, and decline were intimately bound up with the European system of social relations and landholding conventionally defined as feudalism. In the popular imagination, the castle is associated primarily with its military function, but equal weight should also be given to its more domestic aspects and role as a residence. The subject has seen considerable revision in the past two decades, and debate has chiefly focused on the martial character of the castle, with a strong tendency to emphasize the role of the castle as an icon of lordship and as a visual projection of seigniorial power, as much as a tool of war.

Definition

The term "castle" derives from the Latin *castrum*, "fortification," and took a variety of vernacular forms across Europe, such as *chastel* in French, *castillo* in Spanish, *castello* in Italian, and *Berg* in German. The classic definition of a castle is that of "the fortified residence of a lord," which neatly encapsulates the idea that in essence, it is a fusion of both fortification and residence. Such a definition has the utility of distinguishing the medieval castle from those fortifications such as Roman forts and Iron Age hill forts which, although sharing some of these attributes (and confusingly also

sometimes referred to as castles during the Middle Ages and beyond), did not combine both and so never constituted the private residences of individuals. In castle studies, the emphasis has traditionally been placed on the fortified element of buildings, as the presence of battlements, arrow loops, and other defenses marked out a castle from the unfortified manor or palace.

In almost every other way, the definition of the castle is problematic. In particular, arriving at a clear definition is bedeviled by the fact that during the Middle Ages, the word *castrum*, or its diminutive *castellum*, was not only a term applied to fortified residences but numerous other structures, such as chambers, urban defenses, the fighting platforms of ships, and sometimes the precinct walls of monastic houses. Especially in modern English usage, the word "castle" has lost the more wide-reaching medieval definition and refers chiefly to its function as a fortification. A closer medieval approximation is found in the modern French use of the word "chateau," which can apply equally to buildings of the twelfth or eighteenth century, inasmuch as it refers primarily to the noble status of the lordly residence.

A further complication is that even if used in a restricted sense and applied only to the fortified homes of the medieval aristocracy, definitions are hampered by the sheer range of fortified buildings constructed in Europe from the tenth to the fifteenth century. Royal castles, as both residences and centers of administration, were often monumental in design, and castles such as Windsor in England and Vincennes in France were occupied and redeveloped over several centuries. The majority of castles were the residences of the feudal aristocracy, but again, the scale and nature of buildings varied enormously, from the masonry castles of major magnates down to more humble knightly families dwelling in fortifications made of earth and timber. Some, but not all, of these castles also played a part variously in manorial, local, or sometimes national administration.

In addition were the more temporary fortifications built by armies during campaigns or as "counter castles" during the course of sieges. Although these latter castles are more ephemeral structures, some do survive as archaeological monuments, for example, at Burwell and "The Rings" at Corfe in England.

A further complication is that the modern emphasis on the fortification tends to privilege the purely military dimension of castles and focus attention on the defensive elements – battlements, gatehouses, and arrow loops – that are themselves interpreted as purely utilitarian in function. In the past two decades, castle studies has, however, seen a move towards emphasizing the social role of crenellation which stresses that equal consideration be given to the symbolism inherent in building in a military architectural style. In part down to this shifting historiographical climate, more holistic definitions of castles are now employed, such as that used in one recent major survey, which defines the castle as "the residence of a lord made imposing through architectural references to fortification" (Goodall 2011: 6). Such a definition has the advantage of neatly sidestepping the issue over the utilitarian purpose of the defenses but keeps at its heart the idea that the castle was a private fortification.

Historical Background

The overarching characteristic feature of castles is their sheer variety of form. No two castles are identical, and while certain common principles underpin their design and constituent structures at any given point in time, it is their individuality as archaeological monuments that resonate today. When viewed across the Middle Ages as a whole, however, the key elements were the hall, the private chamber, the kitchen, and the chapel, with each structure relating closely either to the demands of noble living or the nature of the noble household. How these building blocks related to each other varied from site to site, but enduring themes were to combine all or some of them into a tower or to arrange them around a courtyard.

For the purposes of analysis, a useful distinction can be made between those castles built of earth and timber and those with masonry

buildings. Earth and timber castles chiefly comprised two forms: the motte and bailey and the ringwork castle (Figs. 1 and 2). In the former, the artificial mound of earth (the motte) was crowned with a timber tower with one or more enclosures (bailey) to one side which housed the ancillary buildings. The ringwork was a simple ditch and bank topped with a wooden palisade with the castle buildings within, but here too it was not uncommon for there to be one or more baileys. It was castles of these types that dominated the early centuries of European castellation.

The principal building of early masonry castles was the central tower today normally called a keep or, as it was known to contemporaries, the great tower or *donjon*. In its early form, the keep represented the traditional elements of the Carolingian palace, the hall, chamber, and chapel,

Europe Incastellated: Medieval Archaeology, Fig. 1 Rathmore Motte, County Kildare, Ireland. Originally the mound would have been topped by a wooden tower

Europe Incastellated: Medieval Archaeology, Fig. 2 Caesar's Camp, Kent, England. A ringwork and bailey castle

integrated into a single structure. Other elements frequently built in stone at early date were the entrance tower or gatehouse and sometimes the curtain walls. From the late twelfth century, there was a general move towards constructing castles (or at least their major elements) from stone, and from c. 1200, the history of castle development is usually discussed in terms of the evolution of masonry buildings. This said, in practice, masonry and earth and timber fortifications coalesced, and it was not uncommon for masonry castles to retain at least some wooden defenses well into the fourteenth century.

The Origins and Development of the Castle

The origins of the castle lay in the collapse of Carolingian kingship and with the resultant power vacuum filled by a dynamic warrior aristocracy, who controlled their fiefdoms from their own fortified bases. In the tenth century, the castle emerged as an expression of the authority of the feudal magnate and the place from which he exercised lordship. The cradle of the European castle is often held to be post-Carolingian France, particularly Anjou where a group of early towers such as Doué-la-Fontaine, Beaugency, and Loches, herald the beginning of the idea of the private fortified residence. A particularly clear case is Doué-la-Fontaine in the Loire valley, where an early tenth-century hall was transformed c.950 into a more defensible tower, itself later embanked by a motte and cut off from the immediate surroundings by a bank at ditch.

The situation in the Loire valley is particularly clear but should be seen as part of a more generalized growth in private fortification across Europe. The rise of the "new" aristocracy about the year 1000, together with economic expansion and improved technological skill in building, ensured that Europe became "incastellated" over the course of the tenth to the twelfth centuries. This process was often, but not always, linked directly to politico-military events. Although private fortification was known in Anglo-Saxon England, it was the Norman Conquest of 1066 that brought about castle-building on a rapid and unprecedented scale and also saw the introduction of new elements of fortification such as the motte and the stone keep. Subsequent Norman campaigns saw the castle brought to Wales, Scotland, and Ireland, and the Crusades saw European forms of castle architecture exported to the Holy Land. Although definitive numbers for the total number of castles built in Europe over the course of the Middle Ages is not known, one estimate puts the figure at a massive 75–100,000, a total that is based upon a wide-ranging definition, some five hundred years of cumulative building and includes both northern and southern Europe (Thompson 1987: 4). More closely defined estimates of numbers for individual areas are predictably lower; in the case of England, a figure just under 2,000 sites is probably realistic (Cathcart King 1983). But this represents total numbers of sites; in reality those in residential use at any one time was much less. In England it has been estimated that during the heavily militarized period at the end of the eleventh century, some 500 castles were occupied (Eales 1990).

Up to about the year 1200, the majority of castles at any one time would have been constructed principally of earth and timber, as either ringworks or motte and bailey castles, although the chronology is subject to considerable variation across Europe. Archaeological excavation has shed considerable light on the nature of these fortifications and done much to dispel the idea that they were the poor relation of their masonry counterparts. At Hen Domen (Wales), excavations of the bailey revealed a series of phases dating from the eleventh to the thirteenth century. During the mid-twelfth century, the impression is one of a cramped enclosure crammed with earth and timber buildings, something that befits a fortress built on the English-Welsh border. Excavated postholes on such sites belie a greater sophistication of the timber castle as a whole, however, which proved extremely durable and was the dominant form in Europe for at least two centuries.

It is against this earth and timber background that the masonry castles that tend to dominate writing should be seen. The late eleventh, twelfth, and early thirteenth centuries were the classic age of the castle keep, with some of the finest examples surviving at Trim in Ireland, Dover in

Europe Incastellated: Medieval Archaeology, Fig. 3 Dover Castle, Kent, England. The donjon of Henry II behind the castle's inner curtain wall

England (Fig. 3), Peñafiel in Spain, and Coucy in France. Such buildings still impress today though their solid massive walls and their design ensured that they were difficult to capture, but donjons also served an important ceremonial role and acted variously as symbols of lordly authority whether or not the lord was in residence.

The thirteenth century witnessed considerable developments in castle design, with larger curtain walls, elaborate gatehouses and increased domestic provision. Castles such as Caerphilly in Wales exemplify these trends, with substantial water defenses, concentric curtain walls, and twin-towered gatehouses. The string of castles built in North Wales by the English king Edward I after his conquest of Gwynedd exemplifies developments up to this time, with Beaumaris often cited as something of the perfect medieval castle, while the twelfth- and thirteenth-century works at Krak de Chevaliers in modern Syria represent something of the high point of medieval military engineering.

The fourteenth and fifteenth centuries were also periods of considerable change in design, with residential considerations and the demands of high-status living coming to the fore. The hallmark of new castles in this period was an increasing sophistication in the spatial planning and the integration of domestic ranges of buildings into the overall design. The advent of gunpowder weapons in the fourteenth century was ultimately to lead to the end of the castle as a military building, but this process was drawn-out and did not happen overnight. Early adaptations for the use of gunpowder weapons are found in the fourteenth century, and by the fifteenth century, gun ports were a familiar part of new castle-building. Developments in artillery had, by the early sixteenth century, rendered medieval fortifications effectively obsolete, and the introduction of the Italianate bastion marked the end of the castle as a military building.

The Castle and War

During military campaigning, the principal role of the castle was to hold up advancing armies and buy the time necessary for a relieving army to be assembled and put into the field. As an immovable defense, the castle also had the advantage of hindering conquest. In order to be successful, the subjugation of any territory by a medieval commander required the reduction or surrender of all castles before any conquest could be considered complete. There were occasions when sieges were important events in national and international politics. The fall of Château Gaillard in Normandy (Fig. 4) in 1204 by Philip II of France precipitated the loss of Normandy by the Angevin kings of England, while the successful siege of Rochester in England in 1215 by King John sent out such a

Europe Incastellated: Medieval Archaeology, Fig. 4 Château Gaillard, Eure, France. During the early thirteenth century, the castle was the scene for one of Europe's most famous sieges

strong message to his rebel barons that a contemporary chronicler wrote that "our age has not known a siege so hard pressed nor so strongly resisted … Afterwards few cared to put their trust in castles."

Castles in the Postmedieval Period

The redolence of crenellation as a sign of lordship and noble status continued however; in areas such as Scotland, castles in medieval style continued to be built into the seventeenth century. Arguably it was only with the rise of Palladian architecture that crenellation lost its association with noble status that the true "medieval" castle ceased to exist. The ruins of castles evoked fascination with postmedieval artists and builders alike and were a common subject for painting and illustrations. During the nineteenth century, medieval fortifications again became the focus of architectural projects either in terms of restoration, as at Carcassonne (France), or for new building projects, such as Neuschwanstein Castle (Germany) and Castell Coch (Wales).

Key Issues/Current Debates

The key issue in castle studies since about 1990 has concerned military function. While the importance of castles as symbols of lordship has always been recognized, the orthodoxy up to this date had been one primarily centered on castle architecture and taken a "form follows function" approach: the evolution of castles, together with the design of their constituent buildings, was driven by the demands of war. According to this approach, the castle underwent a military "rise" up to about the year 1300, with a protracted "decline" thereafter.

Problems with this overarching interpretation were voiced by Coulson in an important article in 1979, which suggested that the placing of fortifications on the homes of the medieval aristocracy may have had as much to do with the expression of social rank and chivalric culture as it did with aiding an active defense by the garrison. The implications of this observation were twofold. Firstly, it suggested that the trappings of fortifications on castles were part of a noble style and not a utilitarian response to the demands of warfare. Secondly, in proposing that war was not necessarily the engine of change in the development of castle architecture, the rationale for the "rise and fall" thesis was effectively removed. Nowhere, it should be noted, is the basic defensibility of the castle denied; rather, there is an acceptance that a military purpose should not be automatically assumed on the basis of the architectural presence of fortification.

In English castle studies, the debate crystallized around the fourteenth-century castle at

Europe Incastellated: Medieval Archaeology, Fig. 5 Bodiam Castle, Sussex, England. The castle was the subject of a major historiographical debate in the 1990s over the military role of such buildings

Bodiam (Fig. 5) with arguments over whether the castle was primarily one connected with the defense of southern England against the French during the 100 Years War or something akin to an "old soldier's dream house," with the trappings of defensive display. Subsequent case studies, such as that at Orford in Suffolk extended this thinking back into the twelfth century, in this case arguing that the form of Henry II of England's idiosyncratic great tower was inspired by nostalgia and ideas of Byzantine palaces, rather than a building constructed at the cutting edge of military design. Such new ideas have been exported across the whole subject. The donjon, for example, is now chiefly interpreted primarily as a vehicle for lordly display and a place of ceremony and ritual, rather than the place built to provide the final refuge in the event of siege. The late Middle Ages too have been subject to redefinition and in place of decline instead seen as a period that sees a continuation of the ideals and ethos of castle-building that were formed in earlier centuries. Moreover, overarching explanations for castle development often take their lead from a small number of buildings built by those at the top of medieval society; those buildings built by those lower down the social scale often exhibit different characteristics. Later medieval Scotland, Ireland, and Northern England is a case in point as this period saw the development and proliferation of fortified towers called "tower houses," which continued to be built into the seventeenth century.

Allied to the questioning of the military role of the castle is the move towards a more holistic approach to the castle, both in terms of the physical buildings and also their place in medieval society. Central to this has been the "landscape approach," which emphasizes the broader geographical context of castles and how the building of castles impacted upon the wider environment. Studies have shown how the majority of castles reflected local conditions such as ease of access to estates, communication networks, and a range of natural and seminatural resources. In turn, the arrangement of estate assets, such as churches, ponds, mills, deer parks, markets and settlements, and sometimes monastic foundations around the castle site not only reflected the demands of economics but also reflected the broader social standing and ambition of the builder. At their most developed, there is evidence that these landscapes structured the approach of visitors to the castle, an observation which only heightens the status of the castle as an icon of lordship.

International Perspectives

When viewed in an international context, castles are one the most important elements in the built

environment from the European Middle Ages. As buildings they not only reflect the warrior ethos of the ruling aristocracy but the social organization of society. The large-scale survival of archaeological and architectural remains represent an important archaeological resource of a society in which land was held in return for military service and, as such, invite comparisons with analogous cultures, such as feudal Japan. European earth and timber castles belong both to an earlier tradition of fortification dating back to the Bronze and Iron Ages and also share affinities with some later bastion forts in which earthworks were the principal defense, for example, the fort of Ninety-Six in South Carolina in the United States, constructed during the American War of Independence. Comparisons can also be drawn with other cultures where earth and timber defenses were the norm, such as Maori *pa* villages in New Zealand and Native American stockades in North America. Masonry fortifications characterize the great civilizations and empires of human history from Antiquity, but the castle retains its distinctive character, in part due to the duality of its status as a fortified residence.

Future Directions

The past 20 years has seen a great deal of academic research on castles, with much of it taking a "revisionist" standpoint. The debate over the military role of the castle has sometimes generated more heat than light, but there are a number of key areas for future work.

The castles built by those at the highest end of the social spectrum have tended to frame wider debates, as have those castles that are well documented (chiefly royal castles) and those that are in state or public guardianship and where consequently structural remains tend to survive relatively intact. Future work is likely to be directed at those sites at the lower end of the range, particularly those that could be termed "sub-baronial" fortifications that lie on the cusp of castle-building threshold.

The place of the castle within the medieval imagination remains understudied. It has become clear from several studies that there is a tendency for castle-builders to look to the past for inspiration as much as taking advantage of new designs, both in terms of architecture and for inspiration for grand projects. For example, in England, Henry II's keep at Dover looked back to an earlier generation of great towers, while Edward I's Caernarfon (Fig. 6) and Thomas of Lancaster's Dunstanburgh both drew inspiration from Arthurian legend. How common examples such as these may have been and to what extent they permeated down the castle-building class are important questions for the future.

The future for castle studies lies in coupling subject specialisms with broader interdisciplinary

Europe Incastellated: Medieval Archaeology, Fig. 6 Caernarfon Castle, Gwynedd, Wales. Together with being a monument to the English conquest of North Wales, the castle also embodied elements of chivalric culture

study. In medieval Europe, the castle was a multifunctional institution that seamlessly blended aspects of fortification, residency, estate management, iconography, and the cultural imagination. It is unrealistic to expect a rounded picture of the castle and its development to emerge without reference to a broad constituency of academic disciplines.

Cross-References

- ▶ Fortifications, Archaeology of
- ▶ France: Medieval Archaeology
- ▶ Hillfort Investigations in the Czech Republic
- ▶ Iberia: Medieval Archaeology
- ▶ Italy: Medieval Archaeology
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Europe: Early *Homo* Fossil Records

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Introduction

Research during the last decades on the first human dispersal out of Africa, into Eurasia, has changed the ideas on the chronology of this event, providing also new data on the ecological scenery that allowed humans to colonize new territories with different environments and climates from those in subtropical Africa, sometimes subject to inhospitable marked seasonality.

The origin of the genus *Homo* is directly related to a radical change in dietary behavior from its mostly vegetarian ancestors, the australopithecines, to more systematic carnivorous activities. This change in diet runs in parallel to an increase in encephalization, which resulted in greater cognitive abilities, and a decrease in gut size (Aiello and Wheeler 1995), thus allowing the emergence of a more intelligent and ubiquitous hominin. Meat is a food resource available everywhere inhabited by large mammals living and dying, which means that the genus *Homo* was

not constrained to only exploiting soft vegetables, eggs, insects, and a few other food stuffs. For this reason, the *change in food behavior* is not only a key issue for explaining the major patterns of biological and social evolution in the human lineage but also helps to explain the dispersal and colonization of new territories around the Earth, especially in the middle and high latitudes, where vegetables are scanty in seasonal climates, particularly in winter, and a substantial part of the feeding resources must be obtained from other animals (Martínez-Navarro 2010).

Definition

There is no evidence outside Africa of the presence of *Homo* without flaked stones. It is probable that our ancestors developed in Africa an unprecedented pattern of dispersals, unusual in the previous related species. So, the presence of *Homo* remains outside Africa implies also the use of technological tools. At this sense, earliest *Homo*, or its ancestor, developed a new kind of non-genetic transmission system, which allowed an unprecedented geographical expansion by increasing its ecological ubiquity during the dispersals across Eurasia. Therefore, the early *Homo* fossil records of Europe are a consequence of different achievements in the development of the genus, modifying forever the basic patterns of biological dispersal among primates.

Historical Background

There has been a persistent debate on the first human peopling of Europe until the middle 1990s. A number of researchers argued for a *Short Chronology*, as they claimed that humans did not colonize the continent before half million years ago, when evolved Acheulian tools associated with remains of *Homo ergaster* appeared in the European archaeological record (Roebroeks and Kolfschotten 1994). However, the finding of (1) a human mandible together with a huge assemblage of Oldowan (Mode 1) lithic artifacts at the Caucasian site of Dmanisi (Georgia), placed at the gates of Europe and dated ~1.8 Ma; (2) Oldowan tools at the sites of Fuente Nueva 3 and Barranco León (Orce, southern Spain), dated 1.3–1.4 Ma; (3) Oldowan lithic artifacts associated with human remains at the site of Atapuerca TD6 (northern Spain), dated 0.8–0.9 Ma; and (4) other findings of lithic artifacts at Early Pleistocene southern European sites in France (Vallonnet, 1.0 Ma) and Italy (Monte Poggiolo, 0.85 Ma; Isernia La Pineta, 0.6 Ma) helped to change the views of prehistorians and paleoanthropologists, considering a *Long Chronology* for the first human colonization of the continent.

Later, the new findings of human cranial and postcranial remains at Dmanisi (Lordkipanidze et al. 2007), a mandibular symphysis and more lithic artifacts at the site of Sima del Elefante (Atapuerca, Spain), dated to 1.2 Ma (Carbonell et al. 2008), and a human tooth and more tools at the site of Barranco León (Orce, Spain), dated to 1.4 Ma (Toro et al. 2013) – as well as new Oldowan lithic artifacts at Pirro Nord (Italy), dated 1.3–1.6 Ma; at Lézignan-la-Cébe and Pont-de-Lavaud (France), 1.57 and 1.1 Ma, respectively at Kozarnika (Bulgaria) 1.6–1.4 Ma; Vallparadís (Spain), 0.9 Ma; and in England at Pakefield, 0.7 Ma, and Happisburgh, 0.8–1.0 Ma – have definitely convinced researchers that humans inhabited Europe as early as one and a half million years ago (Figs. 1 and 2).

At the base of the middle Pleistocene, the arrival into the continent of hominins that developed Acheulian tools is generalized everywhere in most of southern and central Europe, informing on the important demographic increase of human populations.

Key Issues/Current Debates

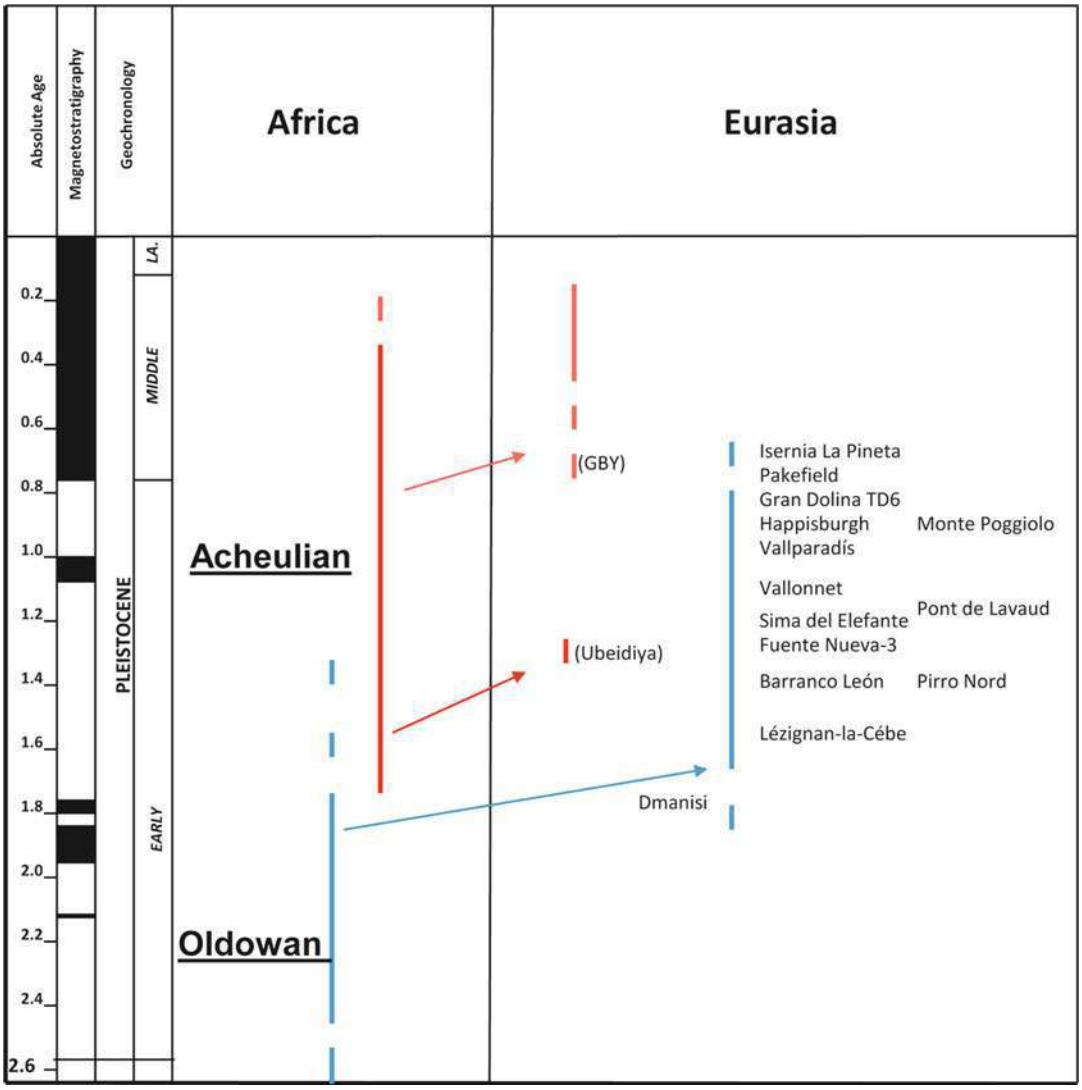
The oldest records of hominins with carnivorous habits, making and using lithic artifacts, are documented at Kada Gona (Ethiopia) at around 2.6 Ma. Curiously, these findings are chronologically coincidental with the Gauss/Matuyama paleomagnetic transition and also with the onset of the "Glacial Plio/Pleistocene" climatic cooling, resulting from bipolar glaciations, which led to the

Europe: Early *Homo* Fossil Records, Fig. 1 Geographical location of some of the most important Early Pleistocene archaeological and paleontological sites of Europe, the Caucasian Region, and the Levantine Corridor: (*1*) Orce (including Barranco León, Fuente Nueva 3, and Venta Micena), (*2*) Atapuerca (including Sima del Elefante and Gran Dolina), (*3*) Vallparadís, (*4*) Lézignan-la-Cébe, (*5*) Vallonnet, (*6*) Pont-de-Lavaud, (*7*) Pakefield and Happisburgh, (*8*) Untermassfeld (only paleontological record), (*9*) Monte Poggiolo, (*10*) Isernia La Pineta, (*11*) Pirro Nord, (*12*) Apollonia (only paleontological record), (*13*) Dmanisi, (*14*) Gesher Benot Ya'aqov, and (*15*) 'Ubeidiya

transition to cooler, drier, and more seasonal climates in the temperate latitudes during the Pleistocene epoch. Glacial ice rafting was produced periodically in the glacial–interglacial fluctuations, being caused by the 41-ka cycle of variations in obliquity of the Earth axis during the interval comprised between 2.8 and 1.6 Ma and by higher-amplitude cycles of 100 ka resulting from variations in orbital eccentricity at 1.2–0.8 Ma (Shackleton 1995).

In Europe, as in Africa, an important faunal turnover is detected around 2.5–2.6 Ma. It is known as the so-called Elephant–*Equus* event, and it is coincidental with the Early–Middle Villafranchian faunal transition. This event is characterized by the arrival in Europe of the first one-toed horses, *Equus livenzovensis*, and the spread of *Mammuthus meridionalis* originated in Africa, although the record of both genera seems to take place somewhat earlier. The same faunal turnover is also detected in Asia, both in the Upper Siwaliks in the Tatrot Formation and Central Asia.

Although there are some references that point to a possible human dispersal into Eurasia older than 2.0 Ma, the oldest clear human record out of Africa is found in Dmanisi during the Olduvai normal paleomagnetic chron, where a very good collection of fossil hominins (crania, mandibles, and postcranial bones) together with Oldowan primitive lithic artifacts has been unearthed. The fossil record of Eurasia reveals an important faunal turnover at this moment, which is coincidental with the Middle–Late Villafranchian transition (Rook and Martínez-Navarro 2010, and references there in), and was called *the Wolf event* after Azzaroli (1983). Recently, this episode has been renamed as "the *Pachycrocuta brevirostris* event" by Martínez-Navarro (2010), because of the deep impact of this giant, hyperscavenger hyaenid of African origin in most of the Eurasian fossil assemblages during the rest of the Early Pleistocene (which is coincidental with the Late Villafranchian), from the Iberian Peninsula through to eastern and southern Asia (Palmqvist et al. 2011). This event is also followed by the



Europe: Early *Homo* Fossil Records, Fig. 2 Chronologic chart of some of the most important Early Pleistocene European archaeological and paleoanthropological localities of Europe, the Caucasian Region, and the Levantine Corridor

arrival of other several large mammal species of African origin, most of them chronologically coincidental with this human dispersal, such as the sabertooth tiger *Megantereon whitei*, the giant gelada baboon *Theropithecus oswaldi*, and the aquatic megaherbivore *Hippopotamus antiquus*, which is a sister species, if not the same, of the giant African hippo *H. gorgops*.

At around 1.3–1.4 Ma, a new wave of dispersal is detected, but it is only well recorded in southwestern Asia at the Levantine Corridor, especially at the site of 'Ubeidiya (Israel), where primitive Acheulian tools have been found together with some large mammals originating in Africa, such as the giant African buffalo *Pelorovis oldowayensis*, the giraffe *Giraffa camelopardalis*, the pig *Kolpochoerus olduvaiensis*, the hippo *Hippopotamus gorgops*, the scavenger and social hunting hyena *Crocuta crocuta*, the sabertooth tiger *Megantereon whitei*, and the giant monkey

Theropithecus oswaldi. These species are mixed with others of Asian origin, such as the giant deer *Praemegaceros verticornis*, the buffalo *Bison* sp., the spiral horned antelope Antilopini indet. (*Spirocerus* sp./*Pontoceros ambiguus*), or the bear *Ursus etruscus* (Tchernov 1986; Martínez-Navarro et al. 2009, 2012). A primitive Acheulian record is also detected in southern India in a chronology close to 'Ubeidiya at the site of Attirampakkam, dated 1.51 Ma.

A new and mostly pan-Eurasian dispersal event coming from Africa is detected during the Early–Middle Pleistocene transition (~0.8–0.6 Ma). Hominins coming with Acheulian (Mode 2) tools colonize the Levantine Corridor, with the best example at Gesher Benot Ya'aqov (Israel) (0.7–0.8 Ma), bringing the domestication of fire with them and a high degree of socialization (Alperson-Afil 2008). The arrival of this developed tool technology is coincidental with the colonization of Europe by *Homo heidelbergensis* and the arrival into the continent of several large mammals of African origin, such as the bull *Bos primigenius*, the elephant *Elephas* (*Palaeoloxodon*) *antiquus* (evolved from *Elephas recki*), the hyenas *Crocuta crocuta* and *Hyaena* sp., the lion *Panthera leo*, and the leopard *Panthera pardus* (Martínez-Navarro and Rabinovich 2011). The arrival of this African fauna is part of the important Galerian faunal turnover, and it is coincidental with the long transition between climates forced by the 41-ka cycles and the later accentuated glacial climate characterized by the alternation of pronounced glacial–interglacial periods modulated by the 100-ka periodicity (Shackleton 1995). This dispersal event has recently been named "the *Crocuta crocuta* event" (Martínez-Navarro 2010).

Climate changes, faunal turnovers, and human dispersals into new continents seem to be coincidental. There is no doubt that climate and climate change interact with the biosphere and can therefore be expected to influence also on human activity, either directly or through paths leading from climate to plant cover to faunal resources. What is not so clear is how and to what degree the social and cultural human evolution interacted with these changes. At this sense, an important question is to explain the effects of increasing sociality in early and more recent humans in order to be more successful during the global dispersal process, in competence with other faunal species and/or human populations.

International Perspectives

Ecological Landscape of the First Human Dispersal Out of Africa

The study of the extraordinary collection from the southern Spanish Early Pleistocene site of Venta Micena (Orce, southern Spain), dated ~1.5 Ma, with more than 17,000 fossil remains corresponding to a large mammal taphocoenosis unearthed from 350 m^2 of excavation (but with a potential of more than one million m^2 to be excavated), has provided interesting information on the paleobiology and paleoecological preferences of the most important species related with the Early Pleistocene human ecological scenario in Europe. Although no human remains have been unearthed for the moment at Venta Micena, all taxa recorded there are found also in assemblages with lithic artifacts and/or human remains from other archaeopaleontological localities on the continent.

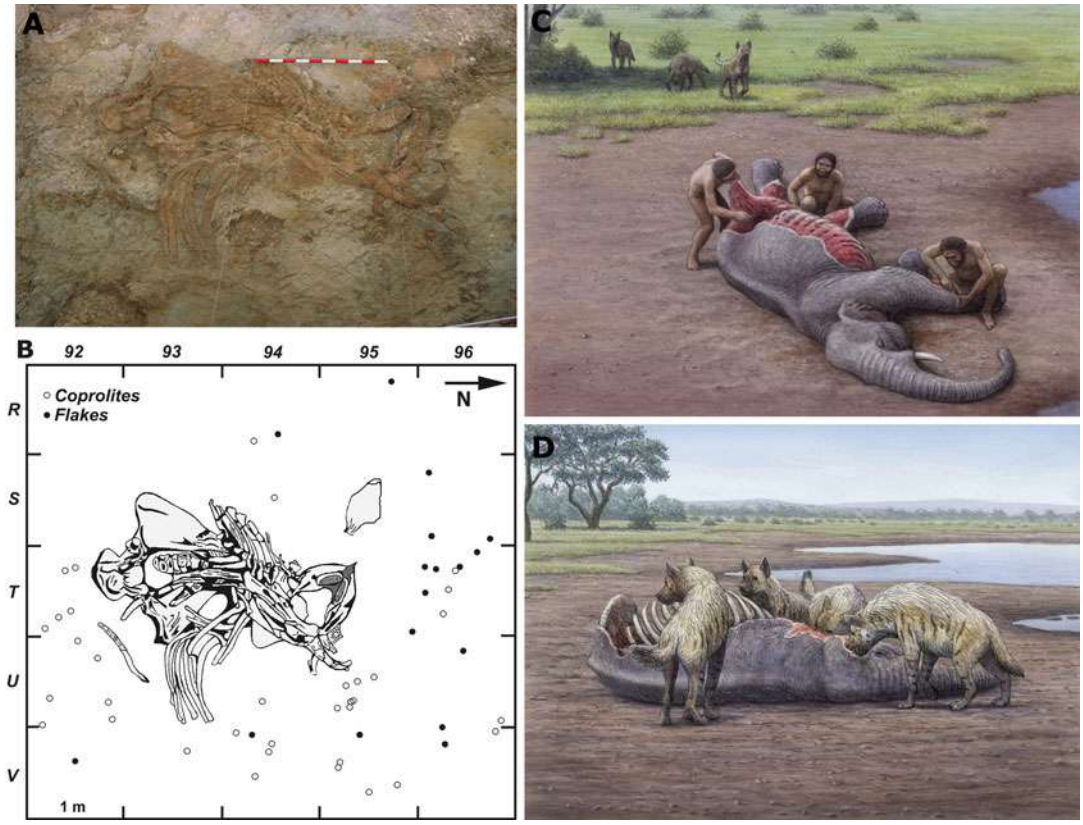
These studies were firstly performed with the African origin sabertooth tiger *Megantereon whitei*, which earliest record outside Africa is at the site of Dmanisi at 1.8 Ma, together with the earliest hominins of Eurasia. It was an ambush, super-predator felid which inhabited mixed habitats and had powerful forelimbs, elongated and non-crenulated upper canines, and a short mandible with reduced precarnassial cheek teeth. It was well adapted to hunt medium- to large-sized ungulates, but its masticatory structure only allowed it to eat the softer parts of its prey, leaving most of the carcass intact for scavengers (see Palmqvist et al. 2007, and references there in; Martínez-Navarro 2010), especially for the giant hyena *Pachycrocuta brevirostris*, but probably also for hominins.

Similar studies were performed with the Early Pleistocene painted dog *Lycaon lycaonoides* thanks to the finding of a pathologic skull preserved complete at Venta Micena, specimen VM

7000. This fossil corresponds to an old individual, 6–7 years old, and shows several pathologies: it is bilaterally asymmetric and, after a radiologic analysis, it was possible to demonstrate that, during its life, it never had the right upper canine (C) and the right third molar (M_3). These pathologies were, probably, the consequence of a high degree of endogamy in the populations of this carnivore species, which resulted in an increase of the level of genetic homozygosis and thus a loss of developmental homeostasis. The canine is a crucial element for a predatory carnivore, but this specimen survived to an old age without it and with a pronounced asymmetry in the skull. The survival of such a pathologic individual suggests that collaborative social behavior helping sick, disabled, and/or old individuals by the other members of the family, as seen in extant *Lycaon pictus*, was already developed as early as the Early Pleistocene (Palmqvist et al. 1999). Similar social behavior, helping an old and toothless human individual, has been detected at the site of Dmanisi thanks to the finding of skull D3444 and jawbone D3900 (Lordkipanidze et al. 2005), showing convergent behavior among social large carnivores and early humans with developed carnivorous habits. Curiously, painted dogs dispersed into Africa coming from Eurasia at the same time (1.9–1.8 Ma) as hominins went out of Africa following the same route, the Levantine Corridor, but in the opposite direction (Martínez-Navarro 2010).

Another example is the paleobiological study of the ethology of the superscavenger that lived in Europe during the Early Pleistocene, the giant, short-faced hyena *Pachycrocuta brevirostris*. It was the largest bone-cracking hyaenid that ever existed. With the mass of a lioness, it had massive limbs with shortened distal bones and a heavy, powerfully built mandible with robust, well-developed premolars. All these features reflect its adaptation for dismembering ungulate carcasses, transporting large pieces of them without dragging to the denning site and fracturing bones. The relative contribution of hunting and scavenging to the diet of this extinct hyena was estimated using combined biomechanical, biogeochemical, and taphonomic approaches. Analysis of the bone-cracking behavior of *P. brevirostris* was based on the abundance of skeletal elements in the large mammal assemblage from Venta Micena. Results obtained showed that the bones with greater marrow contents (femur, humerus, and tibia) were preferentially fractured by the hyenas, while those others with less nutritional value (radius and metapodials) were better represented as complete elements in the assemblage. The quantitative analysis of the preservational state of skeletal elements allowed testing specific patterns of bone modification by the giant hyenas, such as a proximo-distal sequence of consumption for humerus and tibia, thus revealing the highly specialized bone-cracking behavior of *P. brevirostris*. Regression equations adjusted with modern carnivores for body size on craniodental and postcranial measurements provided an average estimate of mass of more than 110 kg for the giant hyena. The high moment arms for masseter and temporalis muscles indicated a substantial strength for bone fracturing with the well-developed premolar teeth. Jaw depth provided resistance against dorsoventral loads during bone-cracking activities. However, the moment arm of resistance for an object positioned at the canines revealed a loss of bite strength compared with spotted hyenas and thus less predatory abilities. These results are in agreement with the scavenging niche deduced for *P. brevirostris* from taphonomic analysis (see Palmqvist et al. 2011 and references therein). After this work at Venta Micena, the direct competence between the giant hyenas and hominins for the exploitation of an elephant carcass (*Mammuthus meridionalis*) has recently been described at the Orce archaeopaleontological site of Fuente Nueva 3 (Espigares et al. 2013) (Fig. 3).

Current work is also in progress with other species, such as the giant African origin hippo *Hippopotamus antiquus* (Palmqvist et al. 2008), showing that this megaherbivore is an aquatic better than amphibious species. The evidence comes from a biogeochemical analysis of bone collagen remains preserved in Venta Micena, which showed that, compared to other ungulates, the hippo $\delta^{15}N$ values were extremely high, even more than in the sabertooth tigers *Homotherium*



Europe: Early *Homo* Fossil Records, Fig. 3 (**a**) Partial skeleton of *Mammuthus meridionalis* unearthed at the Early Pleistocene site of Fuente Nueva 3 (Orce, southern Spain), (**b**) spatial distribution of coprolites and flint flakes surrounding it, and reconstruction of the possible sequence of interaction between hominins (**c**) and hyenas (**d**) during the exploitation of the elephant carcass (Drawings by M. Antón)

and *Megantereon* from the same faunal assemblage. These results showed that this hippo species did not eat terrestrial grasses, as do modern hippos, but was limiting its alimentary income to only aquatic plants such as macrophytes, which do not fix atmospheric N_2. Elevated $\delta^{15}N$ values resulted from the high saline contents (strontium sulfates) of the paleolake waters in the surroundings of Venta Micena, contributed by hydrothermal vents. This inference on the paleobiology of the extinct hippo is also confirmed by skull anatomic adaptations to water living, with more elevated orbital and nasal cavities, and a more elongated muzzle than in the extant, less aquatic and more amphibious species *Hippopotamus amphibius*. In addition, ecomorphological studies have shown that *Hippopotamus antiquus* was 2.2 times heavier than modern hippos and showed shortened limbs, which resulted in less ability for moving on land. The finding of these aquatic megaherbivores in the European Pleistocene sites is very significant and informative, because they need to live in big rivers or lake biotopes and cannot survive in cold waters, under 0 °C, when water became ice. In the case of Venta Micena, contribution of thermal waters resulting from tectonic activity in the Guadix–Baza basin during Early Pleistocene times resulted in a milder environment than today, which made possible the colonization by hippos. Curiously, these ecological and climatic conditions are the best for hominin survival. One interesting data is that

Early Pleistocene African origin hippos are recorded in the Levantine Corridor, the Caucasus, Anatolia, and Central and Southern Europe, but they are not found in other regions of Asia, probably because there were not rivers (waterways) to disperse into the eastern continent. Finally, we can say that the finding of hippos is a good track to try to find hominins (Martínez-Navarro 2010).

Future Directions

Human Autoecology: Tool Typology and Technology and Their Importance in the Food and Social Behavior

Lithic tools are a key question. Although human teeth are bunodont and polyvalent, they are not adequate to cut the animal skin, dismember a carcass, and eat the meat. Our ancestors became systematic carnivores only thanks to the use of artifacts. Without the lithics, the access to animal resources would have been impossible for Early Pleistocene hominins. But thanks to this change in our food behavior, we are finally humans. Thus, the extrasomatic cultural/technical evolution prompted a direct biological evolution.

The access to meat and other more energetic animal foodstuffs, such as the marrow and the brain, changed our anatomy and physiology. Our digestive system, starting from the teeth, became shorter, and our abdomen reduced the volume; the neurocranium and brain grew, increasing the intelligence and, of course, the social skills. Humans became able to move and colonize a latitudinal wide spectrum of environments, only constrained by the need of water, the presence of potential food resources (especially animal carcasses), and, of course, the impossibility of surviving in seasonal climates with very cold winters. Social hominins with primitive Oldowan tools and a scavenging behavior colonized the favorable biotopes of the middle latitudes of Eurasia, around 1.8–1.9 Ma (Lordkipanidze et al. 2007), but they were not able to survive in continental and cold climates until one million years later. At the Early–Middle Pleistocene transition, around 0.7–0.8 Ma as documented at Gesher Benot Ya'aqov, Israel (Goren-Inbar 2011), a new hominin coming from Africa with a new technology, the evolved Acheulian, was able to colonize the territories formerly occupied by the Oldowan hominins in Europe and Asia, probably in direct competition with the previous populations, which were less culturally evolved. Most probably, humans with evolved Acheulian tools were able to hunt and did not depend on the scavenging of the prey left abandoned by the large carnivores, as it was the common behavior of the Oldowan hominins. One of the most important data in support of this hypothesis is that in Oldowan and primitive Acheulian assemblages, large carnivores are abundantly preserved, as it is recorded in Dmanisi (Georgia), the Orce sites of Fuente Nueva 3 and Barranco León (Spain), or 'Ubeidiya, (Israel). However, in the evolved Acheulian assemblages, fossils of large carnivores are usually scanty, as in Buia (Eritrea) at 1.0 Ma, Gesher Benot Ya'aqov (Israel) at 0.7–0.8 Ma, or La Polledrara (Italy) at 0.4 Ma. The possibility of hybridization of Acheulian hominins coming from Africa with local Oldowan hominins living in Eurasia cannot be discarded, as it is evidenced in modern human populations by data on haplotype trees for mitochondrial DNA, Y-chromosomal DNA, two X-linked regions, and six autosomal regions, which suggest a major expansion event out of Africa at 0.84–0.42 Ma, characterized by interbreeding and not replacement of earlier populations (Templeton 2002).

Then, future research has to affect the improvement of the archaeological and paleontological record around the continent, the paleoecological studies of the fossil human environments, and the cultural and social evolution of the early paleolithic societies.

Cross-References

- ▶ Fossil Records of Early African *Homo*
- ▶ Hominin Paleoecology and Environmental Archaeology
- ▶ West and Central Asia: Early Homo Fossil Records

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Europe: Early Upper Paleolithic

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State of Knowledge and Current Debates

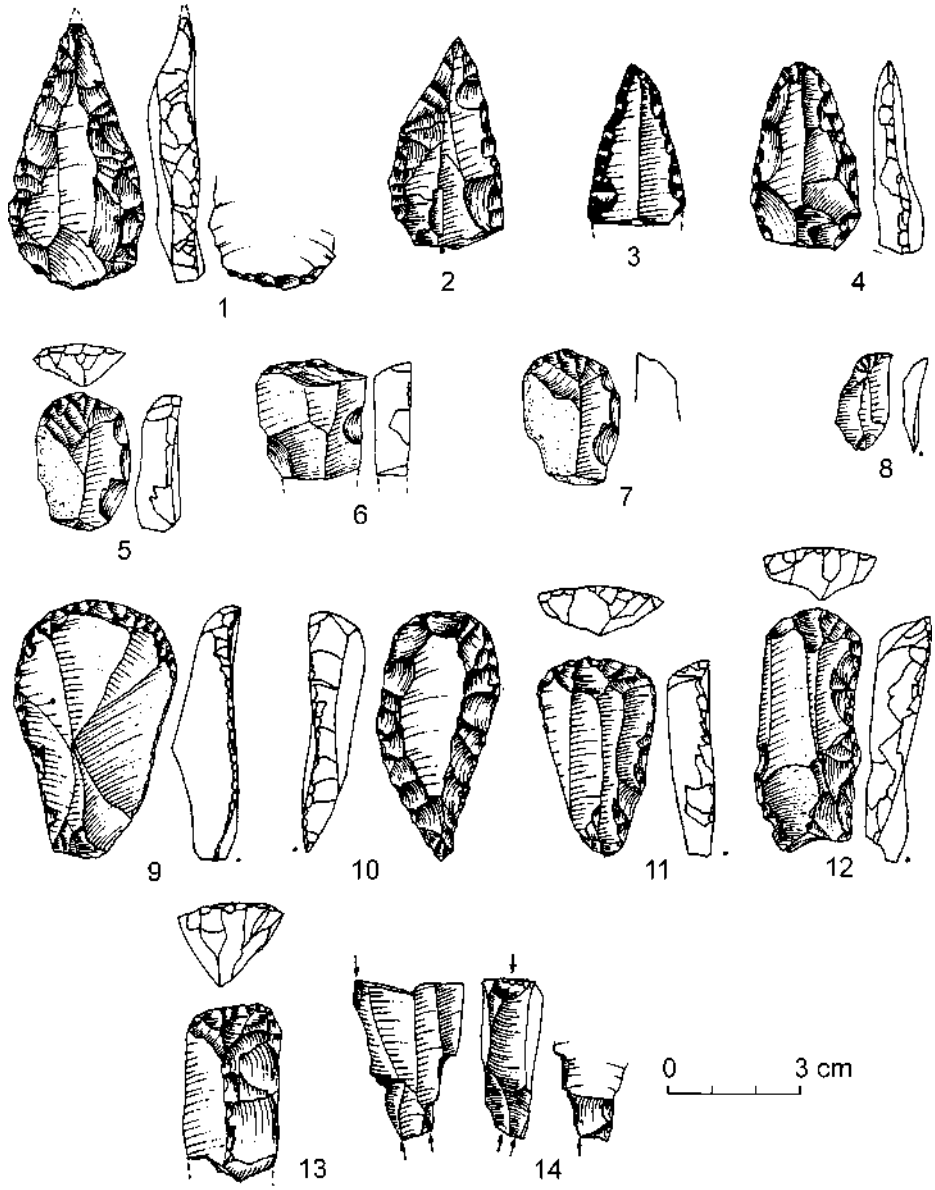
The transition from the Middle to the Upper Paleolithic is a period of the most vital changes in the evolution of population and European cultures when Neanderthals had been replaced by Anatomically Modern Humans and the Middle Paleolithic cultures (Mousterian and Micoquian) were replaced by the Upper Paleolithic cultures. The process of changes that were taking place in Europe between 45 and 30 Kyr BP was not uniform it is nature, but complex and multilinear (Mellars and Stringer 1989; Mellars 1990; Mellars et al. 2007; Kozłowski and Sacchi 2007). In terms of physical anthropology, the concepts of local evolution of Neanderthals into Anatomically Modern Humans have to be rejected on the basis of recent palaeogenetic analyses. Neanderthals evolved locally in western Eurasia beginning from more than 200 Kyr until their extinction between about 30 and 28 Kyr BP (Stringer and Gamble 1993). These populations created a variety of Middle Paleolithic cultures. The Anatomically Modern Humans evolved in eastern Africa more than 250 Kyr and, from northeastern Africa spread first to Eurasia, subsequently to other continents. These populations created a gamut of different Upper Paleolithic cultures (Boyle et al. 2010).

This model is today commonly accepted on the basis of the evidence of fossil mt DNA. Most reports on the first identifications of fossil sequences of mt DNA seem to support the view that mt DNA of Neanderthals is totally unlike that of mt DNA of European Modern Humans. The final split between DNA of the ancestors of the two populations is assumed to have taken place at about 325,000 years ago, still in Africa. Consequently, a model should be accepted of total replacement of Neanderthals by Modern Humans in the effect of the second "out of Africa" migration via the Near East to Europe and to western, possibly also central, Asia (Caramelli et al. 2003; Currat and Excoffier 2004; Serre et al. 2004).

Recently, however, arguments have appeared in support of some contribution of Neanderthals to the formation of the genome of European Modern Humans. S. Paabo et al. (2004) suggested that Archaic Modern Humans had intermingled with Neanderthals; later, however (2008), he admitted that this could have been contamination of fossil Neanderthal DNA by recent human DNA. This issue still remains highly controversial. Some arguments point to genetic differentiation of Neanderthal populations in the period when they cohabited with Modern Humans (Schmitz et al. 2002; Lalueza-Fox et al. 2006); some others point to more divergent Neanderthal haplotypes before 45 Kyr BP (Orlando et al. 2008). Effectively the hypothesis about the total replacement has to be reassessed. Moreover, the fact should be taken into account that the identification of mt DNA of European Modern Humans is based on bone remains from the period as late as 28–25 Kyr BP (i.e., from the period of the Gravettian, when in Europe founder haplogroups I, U, and H were forming – Forster 2004), whereas we do not know mt DNA sequences of early Homo sapiens from the period of Neanderthal/Modern Man cohabitation.

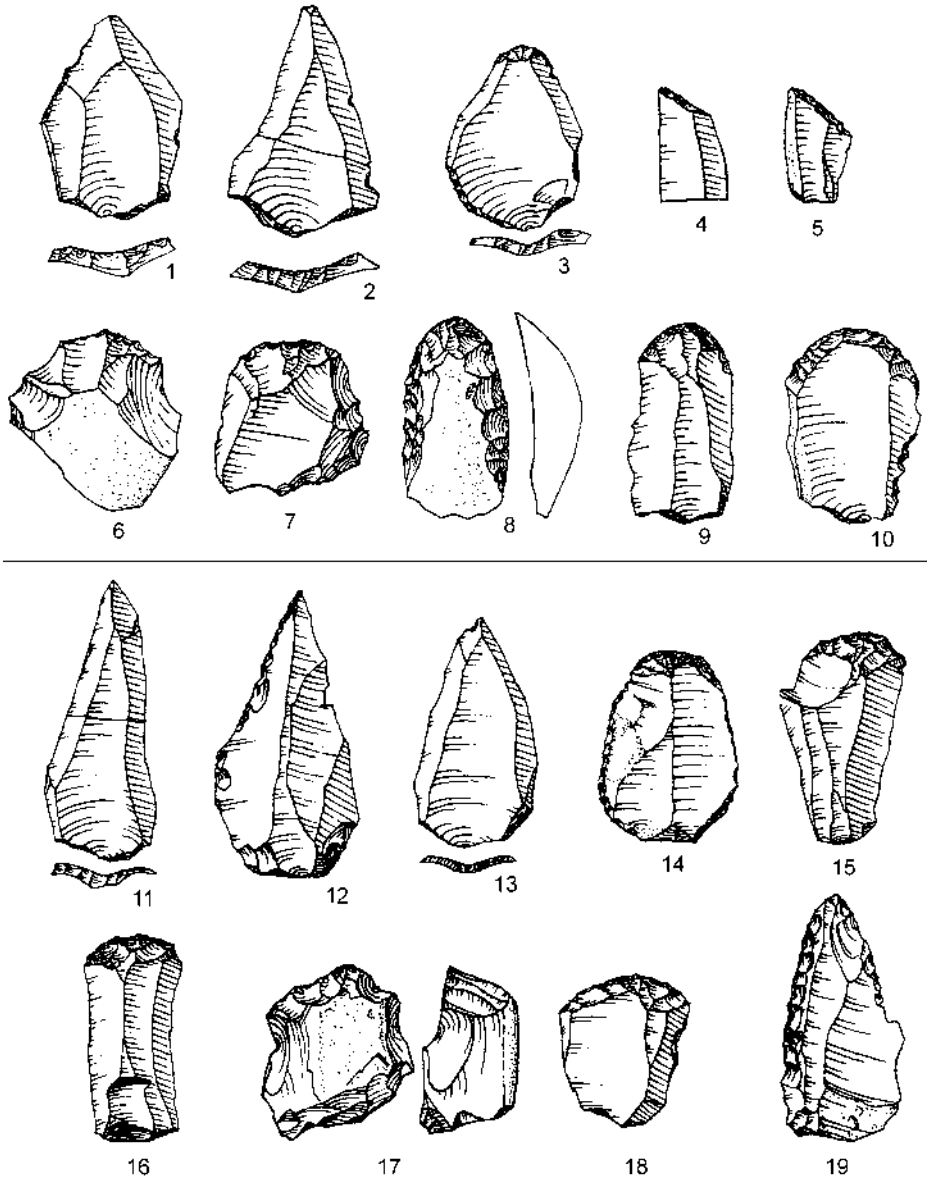
Prior to the beginnings of the Upper Paleolithic in Europe, Archaic Anatomically Modern Humans had appeared in the Middle East about 120–100 Kyr, where, initially, they had been the sole population; it is only about 60 Kyr BP that European Neanderthals arrived to this territory. The two populations co-occur in the Near and Middle East until the first migrations of Anatomically Modern Humans to Europe about 45–42 Kyr BP.

In the Near East taxonomic differences between Archaic *Homo sapiens* of Qafzeh type



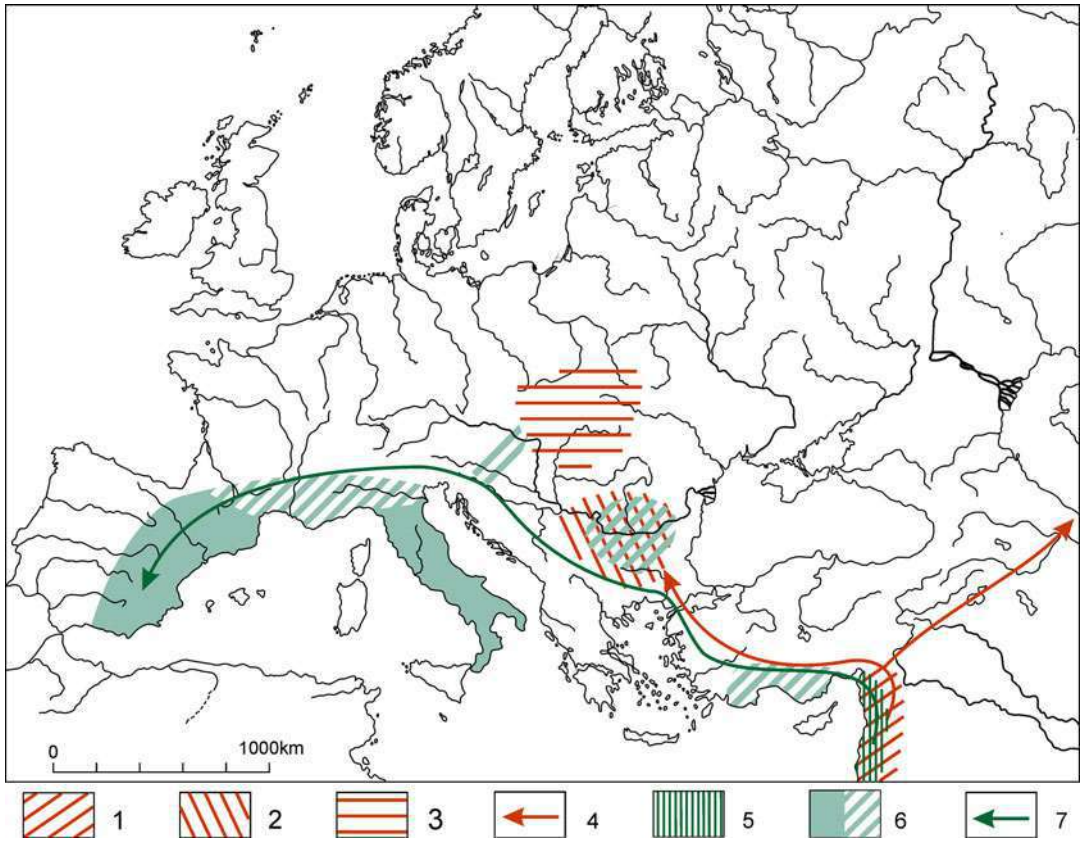
Europe: Early Upper Paleolithic, Fig. 1 Bacho Kiro, layer 11, Bulgaria. Bachokirian lithic implements: *1–8* – retouched Levallois points, *5–13* – end scrapers, *14* – burin

(also Tabun II and Skhul) and Neanderthals from Amud and Kebara are, to put it simply, as those between Levallois–Mousterian type Tabun D and C and the industry of Tabun B (Meignen and Bar-Yosef 2005). Despite taxonomic differences, Archaic Modern Humans and Neanderthals in the Near East are behaviorally similar. Minor differences are in hunting strategies, carcass processing, some aspects of diet reconstructed on the basis of stable isotopes, and in settlement mobility (Stiner 1993; Lieberman 1998). The differences between Archaic Modern Humans and Neanderthals can be seen first of all in the sphere of symbolic culture (e.g., appearance of incised ornaments, grave furnishings – Bar-Yosef and



Europe: Early Upper Paleolithic, Fig. 2 Brno-Stranska skala IIIa, Moravia, Czech Republic. Bohunician lithic implements from layer 4: *1–3* – Levallois points, *4*, *5* – retouched truncations, *6–10* – end scrapers; from layer 5: *11–13* – Levallois points, *14–18* – end scrapers, *19* – sidescraper. (After J. Svoboda)

Vandermeersch 1993; Marshack 1997). In the Near East the cultural evolution leading to the Initial Upper Paleolithic began about 50–40 Kyr BP together with the formation of the Emirian – the unit characterized by the evolution of Levallois technique, which was the most important technique in the Middle Paleolithic Mouster–Levalloisian, into blade technique. As the new technology evolved, other innovations appeared such as the use of the soft hammer which replaced the hard hammer in production of blanks. Several sequences show local evolution from the Levallois–Mousterian to the Emirian, most importantly Boker Tachtit

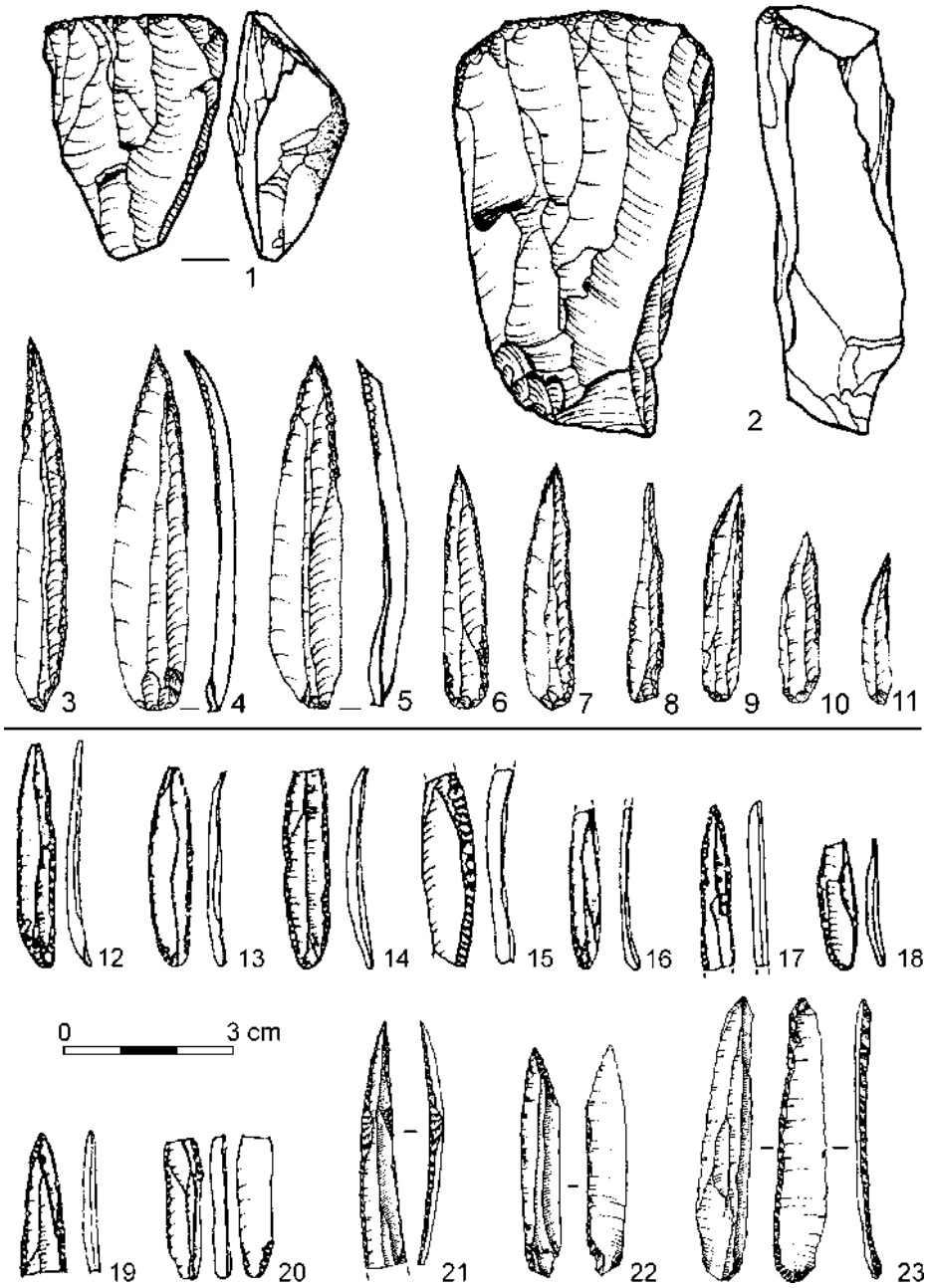


Europe: Early Upper Paleolithic, Fig. 3 Map of the first weaves of Anatomically Modern Humans migrations to Europe: *1* – area of the Emirian, *2* – Bachokirian, *3* – Bohunician, *4* – first migration weave, *5* – area of the Ahmarian, *6* – Proto-Aurignacian/Fumanian, *7* – second migration weave

in the Neguev (layers 1–3) and Ksar Akil in the Lebanon (Bar-Yosef 1998; Bar-Yosef and Pilbeam 2000; Marks 2003).

In Southeastern and Central Europe, similar elements appear of new blade technologies whose presence cannot be accounted for by the evolution of a local Mousterian. We can, therefore, assume that the formation of European Initial Upper Paleolithic cultures such as the Bachokirian in Bulgaria and the Bohunician in the Middle Danube Basin was the result of migrations of Anatomically Modern Humans from the Near East between 45 and 42 Kyr BP (Svoboda and Bar-Yosef 2002; Kozłowski 2004).

The first unit – the Bachokirian – known from layer 11 of the Bacho Kiro Cave and layer VI (trench TD-II) and layer 4 (trench TD-I) of the Temnata Cave (Bulgaria) was characterized by the use of Levallois technique based on the reduction of single- and double-platform cores, which evolved toward the volumetric Upper Paleolithic blade cores. The types of retouched tools include forms representing Middle Paleolithic tradition, but most tools are end scrapers, burins, and retouched blades of Upper Paleolithic type (Fig. 1). It should be stressed that raw material economy, especially in Bacho Kiro Cave, is highly specific based on the exploitation of extra-local siliceous rocks. The occurence at sites of mainly blanks and retouched tools points to the segmentation of reduction process in time and place, thus making the Bachokirian different from local Middle Paleolithic industries (Kozłowski 2004; Tsaneva 2007).



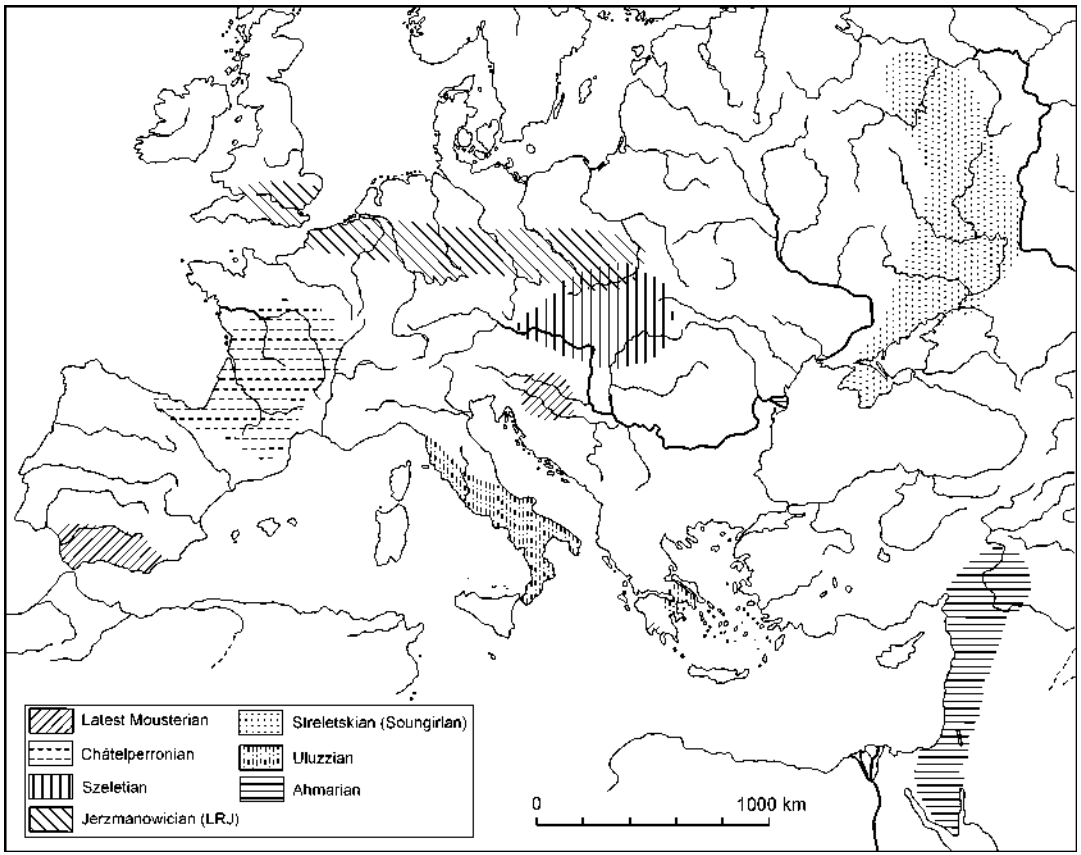
Europe: Early Upper Paleolithic, Fig. 4 Lithic artifacts of the Early Ahmarian in the Near East (*1*, *2* – cores, *3–11* – retouched bladelets after A. Belfer-Cohen and N. Gorring-Moris) and the European Proto-Aurignacian from the Fumane Cave, Northern Italy (*12–23* – microretouched bladelets, after A. Broglio)

The second unit, similar to the Bachokirian, is the Bohunician, known from southern Moravia (Brno-Bohunice, Brno-Stranska skala). This unit exploited mainly south Moravian siliceous rocks that were worked on-site in a full reduction cycle. Blank production, first of all points and blades, was based on Levallois technique; however – parallel to it – the Upper Paleolithic technology of

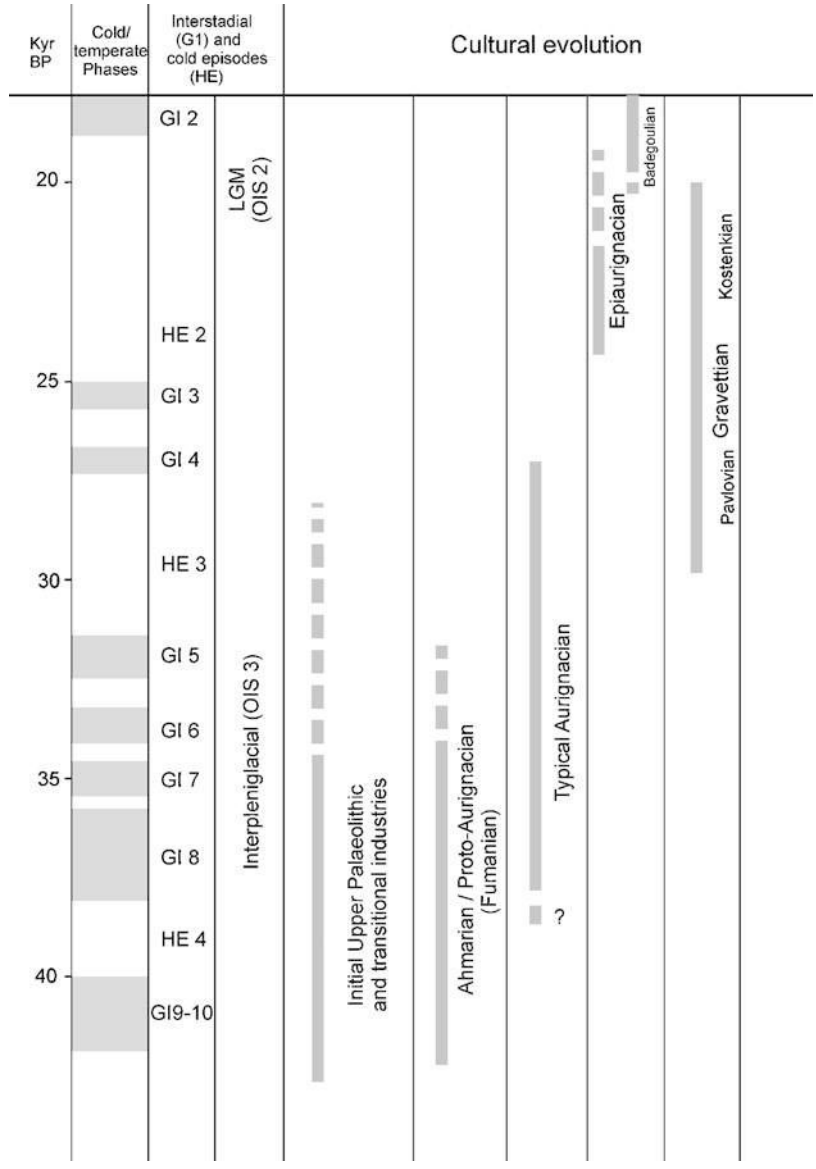
Europe: Early Upper Paleolithic, Fig. 5 Fumane Cave, Northern Italy: painted rock fragments from the Proto-Aurignacian layer. (After A. Broglio and G. Dalmeri)

volumetric blade cores was also used. Among tools, too, there are both Middle Paleolithic sidescrapers and points, as well as Upper Paleolithic end scrapers and burins (Fig. 2). The sites of the Bohunician were situated on the Loess Plateaux in the tundra and steppe environments. Except the hearths habitation structures have not been registered (Svoboda 2003). The range of the Bohunician extended further north to southern Poland (Dzierzyslaw) and probably to Volhynia (Kulitchivka).

After the first expansion of Anatomically Modern Humans, represented by the Emirian from the cradle area in the Near East, further leptolithization (transformation into the Upper Paleolithic) continues (Fig. 3). The process gave rise to the Early Upper Paleolithic, most importantly represented by the Ahmarian on the Syro-Palestinian coast (Fig. 4: 1–11), whose characteristic feature are microretouched bladelets (Bar-Yosef and Belfer-Cohen 2010). From the Early Upper Paleolithic, industries like this are known along the entire northern coast of the Mediterranean where they are described as the Proto-Aurignacian or the Fumanian (Broglio and Dalmeri 2005). Similar industries of the Early Upper Paleolithic are also known from the Middle East (Baradostian in Iraq and Iran – Otte and Kozłowski 2009).



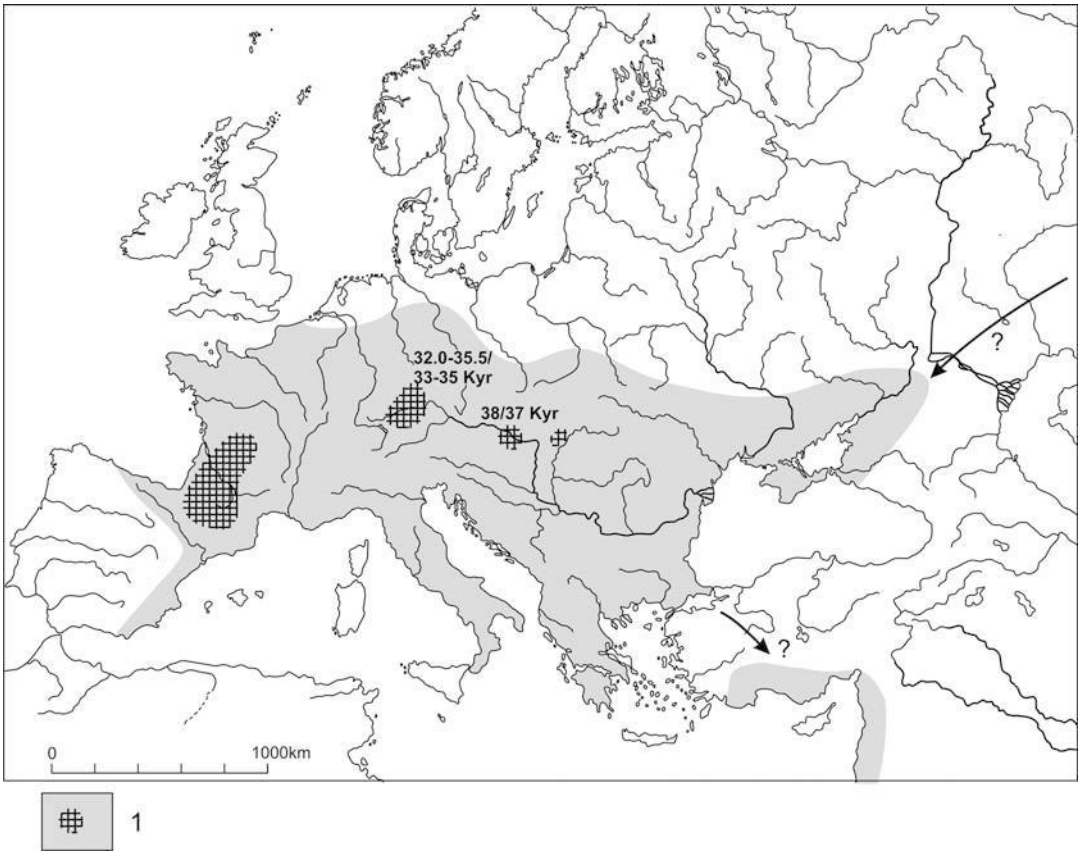
Europe: Early Upper Paleolithic, Fig. 6 Map of the "transitional cultures" and the last Mousterian



Europe: Early Upper Paleolithic,
Fig. 7 Chronological table of the Initial and Early Upper Palaeolithic

Diffusion via Anatolia and the Balkans is documented by Fumanian assemblages in the eastern Balkans (Kozarnika Cave – Tsaneva 2007), in the Northern Italy (Fumane Cave – Fig. 4: 12–23; Riparo Mochi), in Southern Italy (Paglici, Castelcivita), southern France (the southern facies of the Aurignacian acc. to Bon 2002), and in Catalonia (Arbreda, Raclau, Viver, Mollet I, etc. Fullola i Pericot, Soler i Masferrer 2003–2004). The Fumanian displays a fully developed blade and bladelet technique based – among others – on carenoidal cores, also with Aurignacian bone points, numerous shell decorations, with structured layout of camps, and incipients of figural rock paintings (Fig. 5) (Broglio and Dalmeri 2005). Most components of the "Upper Paleolithic" revolution were introduced in the Fumanian; many of these innovations became later a component of the typical Aurignacian – a unit that for several millennia dominated western Eurasia.

Most of the radiocarbon dates for the Fumanian are in the interval between 30 and 33 Kyr BP



Europe: Early Upper Paleolithic, Fig. 8 Map of the typical Aurignacian (*1*) with primary centers in the middle and upper Danube Basin and in France

(Higham et al. 2009). But at some sites in Italy (Castelvicita, Paglici, Serino – Giaccio et al. 2008), also in the Russian Plain (Kostenki 14 – Sinitsin 2003), Fumanian levels are sealed by Campanian Ignimbrite tephra which is the effect of the volcanic eruption of Phlegraean Fields today dated at 39.3 Kyr BP. This age of the eruption has been confirmed by recent AMS determinations (using ABA and ABOX methods) for Upper Paleolithic levels covered by Campanian Ignimbrite from Italy as far as the Russian Plain. It should be added that the Bachokirian in the Temnata Cave is too sealed by tephra from the same CI eruption in Central Italy.

Besides these two units (Levallois-derived and Proto-Aurignacian/Fumanian), alien in Europe, some units developed on local substratum of Middle Paleolithic traditions. "Transitional units" emerged in Europe in the period of cohabitation of Neanderthals and Anatomically Modern Humans; it is difficult to decide whether "transitional units" are the effect of exclusively local, autonomous evolution of Middle Paleolithic tradition or the effect of contacts with and "borrowings" from the first Homo sapiens. "Transitional units" evolved from the Mousterian as well as the Micoquian; besides technological traditions of the Middle Paleolithic, "transitional units" display, too, in a various degree, Upper Paleolithic technologies and stylistics (Fig. 6).

From the Mousterian evolved units using blade technique and steep retouch shaping backed pieces: in Western Europe this is the Chatelperronian (Pelegrin 1995) and in central Mediterranean the Uluzzian (Palma di Cesnola 1993). In both units blade technique was used to produce blanks retouched into backed points.

From the Micoquian evolved industries with bifacially retouched leaf points, technologically highly advanced; in Central Europe this is the Szeletian and in Eastern Europe the Streletskian/Sungirian. In these units the Upper Paleolithic component is represented by mainly end scrapers, but basic tool kit is on flakes.

Unfortunately, we have very little data on the biological nature of the populations of "transitional units." We know that at least the early phases of the Chatelperronian and the Szeletian can be ascribed to the Neanderthals (compare remains from layer EJOP at St. Cesaire, also – in all likelihood – from the lower Szeletian layer from the Szeleta Cave in Hungary). If we take into account the long duration of the functioning of these units (e.g., Szeletian and Streletskian/Sugirian until the middle phase of the Upper Paleolithic 27/25 Kyr BP), we can assume that late populations of these units were already Anatomically Modern Humans. It should be stressed that one of the individuals from the relatively late graves from Sungir in the central Russian Plain (dated to about 27 Kyr BP) shows – as some anthropologists claim – some Neanderthaloid features, while the second individual is typically modern. This interpretation is, however, still controversial (Mednikova 2005).

The period when Neanderthals vanished and the Anatomically Modern Humans expanded saw rapid climatic changes (RCC) with large amplitudes (Dansgaard/Oeshger fluctuations, between subsequent Heinrich 4 and 2 cold events). The environmental changes, rhythmically repeated, could not have major influence on the recession of the Neanderthals and the expansion of Anatomically Modern Humans. Rather it was the competition for ecological niches, to which Neanderthals had been adapted, that was the main cause of the extinction of Neanderthals before the Glacial Maximum when this population was pushed into enclaves in Andalusia, Croatia, and Crimea (Fig. 7).

The final stage of the formation of the Upper Paleolithic in Europe is represented by the typical Aurignacian (Fig. 8), mostly dated after 36 Kyr BP (Kozłowski and Otte 2000; Otte 2010). The origin of the typical Aurignacian is the subject of discussions, but it seems most probable that the Proto-Aurignacian/Fumanian was its ancestor. Some centers of the early phase of the typical Aurignacian were situated more to the north from the Proto-Aurignacian, i.e., in the middle and upper Danube Basin and in southern France (Teyssandier 2007).

Cross-References

- ▶ Art, Paleolithic
- ▶ Bone Tools, Paleolithic
- ▶ Lithic Technology, Paleolithic

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Europe: Mesolithic-Neolithic Transition

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Introduction

As is known, the Mesolithic is not distinguished by striking specific traits in the archaeological record: it is actually defined as the age of the "middle" Stone Age, halfway between the "early" Stone Age, or Paleolithic, and the "new" Stone Age, or the Neolithic. In addition, it is the last prehistoric period recognized as such (Rowley-Conwy 1986: 17), and its origin seems to be vitiated by errors of assessment. The first and chief student of European Mesolithic, Grahame Clark (1980), who has also recounted the history of the emergence and development of that concept, concludes that it was defined by the so-called hiatus theory, based first on the belief that there were few archaeological traces of this period (occupation gap), and later also on the belief that the cultures of that period were of minor importance (cultural gap). The theory of discontinuity, according to Clark, "can be shown to have warped much of our thinking" (quoted in Rowley-Conwy 1986: 17). There were additional difficulties later: the introduction of the term Epipaleolithic, used to designate the end of the Paleolithic and superimposed ambiguously upon the Mesolithic, and the occasional use of the term Neolithic to indicate not only the new economy but also those hunting cultures which are still Mesolithic, but which already use pottery.

Definition

What is then the modern meaning of the concept of the Mesolithic? From the chronological point of view, it is easy to describe, since it coincides with the end of the glaciation in Europe and the beginning of the postglacial period, that is, of the climatic conditions of the Holocene. In this sense, it is possible to argue that the Mesolithic is the first archaeological period of the Holocene, which began about 11,000 years ago, and comprised the last European fishing and hunting cultures, highly specialized and extremely productive particularly in the area of northern Europe, recently freed from ice. In fact, agriculture emerges as the dominant economy immediately after the Mesolithic cultures.

Key Issues/Current Debates

Nevertheless, the problem of the Mesolithic is not in its chronology, but in the evaluation of its role. Therefore, some fundamental questions have to be asked: Is the Mesolithic merely a period of highly specialized postglacial fishers, or something much more? Is it simply a continuation of the Upper Paleolithic (Gamble 1986), somewhat more advanced in some western parts of northern Europe, but static in central Europe (Vencl 1986), or a period of major innovations leading to the development of agriculture and facilitating its adoption? What was the role of the Mesolithic in the transition to agriculture: a passive role in face of invasion and colonization, or an active role, involving contribution and collaboration?

Seen within the framework of current archaeological research, the transition from the Mesolithic to agriculture can be explained in two radically different ways: by giving western Asia, as the fountainhead of agriculture, the chief role in this transition, effected in the course of the colonization of Europe, or by assigning that role to Europe and assuming that the transition was the result of a supposed process of adoption and/or active development by European Mesolithic hunters and gatherers. According to the former view, the cultivators migrated from east to west

and colonized Europe, and the European hunters and gatherers were mere survivors, destined to be absorbed by the newcomers; according to the latter view, the cultivators and the hunters-gatherers were the same persons, and agriculture emerged as a result of an active process during the transition from one economy to another. In the former case, all the innovative developments took place in western Asia, and the role of the Mesolithic hunters and gatherers of Europe was limited to that of assisting the inexorable advance of the oriental Neolithic civilization. In the latter case, the autochthonous hunters and gatherers were the principal factors responsible for the transition, which was carried out with an equipment of the do-it-yourself type, adapted to intensify the practices of the management of groups of animals, practices which, according to this view, can be traced back to the Upper Paleolithic and which had been experimented with in connection with all animals, from snails to sheep, well before the Neolithic (Zvelebil 1986b: 175).

At the center of this ongoing controversy concerning the Mesolithic and its role in the transition to the Neolithic is the thought of an entire archaeological school, represented by scholars like Clarke, Ashbee, Dennell, and Price (Vencl 1986: 43), which maintains that the Mesolithic hunters and gatherers made a fundamental contribution to the process leading to the emergence of agriculture in Europe and which arrives at the conclusion that there was not a break but only, or at least predominantly, continuity. Typical of this school is the assertion: "In virtually every area of Europe, the transition from Mesolithic foragers to Neolithic farming witnesses distinct aspects of continuity in human adaptation… The end of the Mesolithic is not brought about by an advance of invading farmers but rather reflects a period of readaptation and adjustment to changing environment and new subsistence practices, often within the context of existing societies" (Price 1983: 771).

It is quite clear that the new view of the Mesolithic is a typically processual one, which opposes continuity and processes of local development to the hypothesis of an invasion from the east. As an archaeologist has said: "continuity, rather than contrast, is the fashion of the day" (Zvelebil 1986b: 168).

The study of continuity, naturally, leads to two different results depending on the context. Where continuity is an already existing phenomenon, that is, in the substantially unitary long periods of prehistory (Paleolithic, Neolithic, the Metal ages), the tendency is to find elements which anticipate the next period and prepare the transition to it. Where discontinuity is implicit, that is, in the transition from one period to another, the tendency is to look for continuity and downgrade the disruptive elements.

As regards the transition from Upper Paleolithic to Mesolithic, for example, research has brought to light numerous traits which link these two periods in spite of their discontinuity. The technological ones include the bow and arrow, harpoons, and tools made of polished stone. Among the traits concerning the use of resources are fishing, gathering of sea food, and, possibly, domestication of the dog. The organizational traits include logistic mobility, storage of products for later use, tendency toward sedentarism, and specialization of labor.

As regards the Mesolithic, the traditional view, which interprets the postglacial socioeconomic developments as a later elaboration of patterns already emergent in the Upper Paleolithic and postulates a neat break only at the beginning of the Neolithic, is opposed, as I have already said, by scholars who see the postglacial period as an age of such fundamental innovations that it led inevitably to the agriculture of the Neolithic (Zvelebil 1986b: 168).

The Neolithization of Europe: Zvelebil's Theory

Confronted with the two opposed theories of Mesolithic – either exclusively indigenous development or exclusively external colonization – one may naturally ask: Is it really necessary to adopt one of these two models? Would it not be possible to take a less clear-cut view, without abandoning completely the model of colonization and also leaving place for local processes (Zvelebil 1986b: 167–168)?

A major representative of the innovating school, Marek Zvelebil, who has recently been

defined "as being among the most important and influential archaeological thinkers of his generation" (Lillie 2011), stands out as both editor of a fundamental collection of studies (Zvelebil 1986) and author of two major articles (Zvelebil 1986a, b), in which he advocates a position of the above mentioned type, which seems to me particularly congruent with facts and free from apriorism.

Zvelebil directs his criticisms primarily against the traditional invasionist approach, which is in his view impaired by too reductive a view of the hunting-gathering cultures. Actually, Zvelebil, too, shares what is today the common view of archaeologists and historians of archaeology: the identification of colonialism as the source of many ideas, ideological rather than scientific, which persist in archaeology to the present day. To him, the endurance "of prejudices towards recent hunters-gatherers [is] itself a consequence of the European colonial expansion" (Zvelebil 1986b: 6–8).

This constant emphasis on ideology as an explanatory factor is in my view one of the major merits of modern archaeology. According to Zvelebil, it was only with the publication of *Man the Hunter* (Lee and De Vore 1968), which introduced the conception of the affluent forager, that an approach not vitiated by ideology was adopted in the study of hunter-gatherer cultures. The discovery of the economic prosperity of the forager of Upper Paleolithic and Mesolithic led to the discovery of his social complexity and to the emergence of the notion of the complex forager and that in turn was followed by the resumption – after a long interval – of comparative studies of ethnographic and archaeological cultures of hunters and gatherers. These studies gave rise to a new conception of hunting-gathering cultures, the basic traits of which are (1) a remarkable degree of sedentarism, (2) increase in demographic density, (3) socioeconomic differentiation with consequent division of labor, (4) development of trade, (5) emergence of war, and (6) intensification of social and ritual life (Zvelebil 1986b: 8). In other words, traits previously attributed solely to the revolutionary cultivators of the Neolithic were now recognized as existing also in the immediately preceding societies of hunters and gatherers. Seen in this light, the postglacial hunters and gatherers represent, needless to say, the necessary "prelude" to the cultivators.

Zvelebil then makes some lucid comments on certain factors of innovation which emerge as a result of the great ecological changes at the end of the glacial: the awareness of the seasonal availability of resources, the risk and effort involved in the exploitation of resources within such seasonal limits, and the development of important technical innovations for the more efficient use of the time available for exploitation. The new implements for fishing (ditches, traps, dams, and nets) can be in fact seen as means of saving time and ensuring storage (Zvelebil 1986b: 169–170), serving the same purpose as composite tools (microliths set into wooden or bone handles) (Zvelebil 1986b: 168–169).

The relationship between the increase of sedentarism and the increase of population is also important. Among the modern ethnographic populations, the demographic increase of fishers, leading a sedentary life and using storage of resources typical of the Mesolithic, is equal to that of the simple farming populations, and it is much higher than the increase in the hunting-gathering societies (Zvelebil 1986b: 172).

Recent research has identified some Mesolithic technical innovations which were unknown in the Upper Paleolithic but are common in the Neolithic: new flint working techniques; some types of bone and antler tools such as axes and sickles; nets, fish traps, and other sophisticated implements for fishing and hunting; pottery; means of transportation like sledges and skis; the majority of objects of adornment; new burial rites; etc. (Zvelebil 1986b: 168).

Other scholars (e.g., Higgs and Coles 1969) have identified pre-Neolithic forms of managing herds of ungulates, which show that it may be possible to trace the beginnings of the techniques of domestication to the early postglacial, and even to the late glacial, in geographical areas which include the Mediterranean and parts of temperate Europe (cf. Zvelebil 1986a: 9; Forni 1990).

Accordingly, European agropastoralism might represent a continuation of tendencies which

asserted themselves in the Mesolithic. This is particularly apparent in southeastern Europe and in the western Mediterranean, where it assumed the form of a replica and development of the already existing systems of the exploitation of resources (Zvelebil 1986b: 181).

The transition to agriculture took place against this complex and innovative background. Zvelebil distinguishes a number of approaches to this problem, which, for convenience sake, can be reduced to the two already mentioned opposite views: the traditional invasionist model and the innovative model based on the principle of continuity.

The traditional diffusionist and invasionist model is based on the idea of the absolute superiority of agriculture, as an economic system, to hunting and gathering, and, consequently, of the invaders to the natives. The adoption of agriculture is seen as a more or less automatic process, followed, after the conversion, by the colonization of new areas by the neo-agricultural communities and by the dislocation and assimilation of the surviving groups of hunters (Zvelebil 1986a: 8–9).

Zvelebil is critical of this model of the Neolithization of Europe and particularly of that based on the so-called wave of advance, proposed by Ammermann and Cavalli Sforza (1973, 1984), which has also inspired Renfrew (1987). According to these authors, the wave-like spread of agriculture is compatible with the real dates of the diffusion of agriculture as established by archaeology, as well as with the patterns of genetic variation of the European population, as established by geogeneticists. Zvelebil considers this as a more sophisticated variant of the traditional model insomuch as it assumes a uniform diffusion of agriculture in Europe from its center in western Asia, with a gradual colonization of areas increasingly remote from the original source of diffusion. His objection is that this model is too reductive as regards the hunting-gathering cultures and that it assumes a "normal" (instead of "exceptional") discontinuity between the Mesolithic and the Neolithic, in spite of the fact that there are many evident forms of overlapping and continuity between the cultures belonging to these periods (Zvelebil 1986a: 10–11).

It may be useful to enumerate at this point both the responses of the supporters of the invasionist model and Zvelebil's counterarguments (Zvelebil 1986b: 177–178).

I. The wave of advance of agriculture clearly spreads from the eastern Mediterranean northward and westward, which proves the eastern provenance of the colonizers.
   1. Counterargument: the diffusion might have been a diffusion of new traits of economy, not necessarily of people.

II. There are notable similarities between the material culture of the cultivators from western Asia and that of European cultivators, particularly in pottery and stone technology.
   2. Counterargument: there are equally numerous proofs of continuity between the material culture of the European Mesolithic and the Neolithic. One thing does not exclude the other.

III. It may be expected that the superior numbers of the farming populations led to the assimilation and disappearance of the less numerous autochthonous communities.
   3. Counterargument: the Neolithic demographic potential has been overestimated and that of the Mesolithic underestimated.

      Zvelebil adds to these three counterarguments two arguments of a different kind but in my opinion of considerable weight.
   4. It has been established that the wild ancestors of some species domesticated later were present in the Mediterranean, too, so that it is possible that there was a local development of the process of domestication.
   5. There is no proof of demographic pressure in western Asia which might have driven colonizers to migrate, and there is little proof of early Neolithic settlements in western Turkey, supposed to be the base for the colonization of Europe (Zvelebil 1986b: 178).

Further elaborating his model, Zvelebil (1986b: 178–179) distinguishes four types of habitats in Europe:

A. Areas ideal for agriculture and not suitable for hunting and gathering: the Thessalian plain, the Tavoliere in Puglia, the loess regions of central Europe, and the basins of great rivers such as the Danube, the Rhine, or the Seine. It is not by chance that these were the first areas to be cultivated.
B. Areas suitable for both farmers and hunters-gatherers: river valleys and large coastal plains. These areas witnessed the introduction of agriculture immediately afterward.
C. Areas very suitable for hunting and gathering but rather unsuitable for cultivation: the coastal zones of Scotland, estuaries, river gorges, and lakes. They were the last to adopt agriculture in the initial period.
D. High and mountainous zones, which were cultivated or exploited for stockbreeding only in the stage of the secondary expansion of agriculture, in the late Neolithic.

Hence, Zvelebil's important conclusion: the expansion of agriculture did not follow the wave model but had a mosaic-like pattern.

Natural factors, on the other hand, do not explain everything: the boundary of agriculture remained stationary in the north European plain for a long time, as might be expected, but there was a long delay in the adoption of the new economy even in some areas suitable for cultivation, like the river valleys and the terraces of Ukraine and the southern Urals. Variations of this type can be explained only by assuming that they were caused by local factors, such as the favorable socioeconomic conditions of the local hunters and gatherers (Zvelebil 1986b: 180).

The originality of this analysis consists in the new general interpretation of the Mesolithic and Neolithic economy: the highly specialized Mesolithic hunting and gathering and the Neolithic agriculture are no longer seen as "stages" of an evolutive sequence with a predictable outcome but as specialized systems of exploitation, alternative and parallel, and both conditioned by the varying ecological factors prevailing in the difficult postglacial conditions: in western Asia, there was genetic domestication of mutually complementary animal and plant species, while moderate Europe saw only an advance in technological specialization and intensification of exploitation, without any form of animal or plant domestication (Zvelebil 1986b: 173–174). In western Asia, there were both wild cereals and gregarious ungulates, amenable to domestication; in Europe, on the other hand, there lived red deer, roe deer, the stag, the moose, and the gazelle, none of them responsive to domestication. The only European animals which could be domesticated were the wild pig, the wild ox, and the goat. Hence the hypothesis of a limited domestication of the goat, bovine cattle, and the pig in eastern Europe and on the southern fringes of central Asia. The picture is not different as regards the domestication of plants.

On the basis of this, Zvelebil argues that agriculture could not have developed in temperate Europe. Besides, agriculture had a decidedly minor role in the European areas where the hunting-gathering economy attained a high level of productivity (i.e., along the Atlantic coast and the ice cap, as well as in the valleys of great rivers and lakes – all habitats rich in aquatic resources), because the level of prosperity achieved by the Mesolithic economy favored the continuation of specialized hunting and gathering (Zvelebil 1986b: 181). Nevertheless, there were always contacts and mutual influences between the two systems, since the boundary between the two areas was not closed, but "porous" (Zvelebil 1986b: 182–183).

To conclude, Zvelebil (1986b: 175) advocates a regional model of transition to agriculture, which combines and integrates the invasionist and evolutionist approaches, and leaves the determination of their respective contributions to the interpretations of objective archaeological data. As a result, we have the following situation.

I. In the eastern Mediterranean (Greece), in the Balkans and central Europe, archaeological evidence indicates that the introduction of agriculture was a rapid process developing on the foundation of a complete "package" of cultivated plants and domesticated animals, with the appertaining techniques of exploitation, introduced from the outside.

Consequently, the Neolithic cultures of Tripolye in Ukraine, the Linear Bandkeramik (LBK) in central Europe, the Funnel-Beaker culture (TRB) of Scandinavia, and the Impressed Ware culture of southern Italy are seen as intrusive cultures and products of colonization (Zvelebil 1986b: 184).

II. The archaeological documentation for the second group of areas shows that a rapid process of local adoption took place, that is, that agriculture was taken up by the indigenous populations in a local Mesolithic context. The most likely area in this group is the western Mediterranean, where agriculture appeared too soon to be a result of migration (Zvelebil 1986b: 175, 184).

III. In the two lateral areas, on the shores of the Atlantic and in eastern Europe, archaeological evidence indicates a much slower process of local adoption, protracted over millennia.

Besides, in the areas where archaeological evidence indicates colonization, the most likely explanation is not a wave-like invasion, but a limited, regional immigration, followed by the adoption of agriculture by local hunters and gatherers (Zvelebil 1986b: 185). There is in fact much more archaeological evidence of population movements in temperate Europe and Asia during the late Neolithic, Eneolithic, and the Bronze Age than at the beginning of the Neolithic. The processes of proper colonization seem to begin only after the initial period (Zvelebil 1986b: 186).

To sum up, the Mesolithic can no longer be considered as a lull, as maintained by the traditional theory, nor, as the most radical innovating school asserts, as an epoch which saw a uniform and smooth development of the Neolithic from a Mesolithic base (Zvelebil 1986b: 167). It is rather a period of transition, which lasted much longer than was thought previously and which was of an extremely complex nature. The hunters-gatherers of the Mesolithic adopted cultivation selectively and not indiscriminately and not everywhere.

Accordingly, the general principle of continuity remains valid: the Mesolithic "prepared" the Neolithic, just as the Upper Paleolithic "prepared" the Mesolithic. But Zvelebil also admits, and that seems to me the principal contribution of his theory, the possibility of intrusive ethnic contributions, limited to certain areas, which were reabsorbed by autochthonous populations.

Zvelebil's model is superior to the exclusively migratory model of Neolithization, adopted by Renfrew; it is also more plausible than the model based on a radical conception of the role of the autochthonous population. It does not reject a priori either migration or autonomous development, and it makes use of both processes only when this is warranted by archaeological documentation and a careful study of evidence.

Linguistic Evidence of Continuity from Mesolithic to Neolithic

Language also confirms the continuity model of the transition from Mesolithic to Neolithic, as can be shown, for example, by the common origin of the name of "tar" in three different linguistic areas of Europe. As is known, the extraction of tar from trees has been dated to Mesolithic by prehistorians (e.g., Clark 1975: 127, 140, 171). And in fact, (1) the English word *tree* (from Proto-Indo-European root **deru* "tree, wood") is akin to the northern European words for "tar": Icel. *tjara*, Norw. *tjøra*, Swed. *tjära*, Dan. *tjøre*, Old Engl. *tierwe* (f.), *teoru* (n.), Old Fris. *tera*, Middle Low Gm. *tere*, Middle Dutch *ter(re)*, *tarre*, Germ. Du. *teer*, Engl. *tar*, Lith. *dervà* "pitch, tar," Lett. *darva* "tar," Finn. *terva* (Pokorny 1969: 214–217). (2) In the Alpine region, the Latin word *bitumen* "tar" comes from the Latin word *betulla* "beech" (cf. Germ. *Birkenteer*) (Ernout and Meillet 1959–1960 s.vv. *betulla*, *bitumen)*. And (3) in the Mediterranean area, the Latin word *pix* "pitch" comes from *pinus* "pine tree" (Pokorny 1969: 794).

Cross-References

- ▶ European Mesolithic: Geography and Culture
- ▶ Foraging to Farming Transition: Global Health Impacts, Trends, and Variation

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Europe: Middle to Upper Paleolithic Transition

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Introduction

This "transition" condenses in fact an extreme variety of cultural factors dispersed across all continents but especially in the "Old World": Africa, Europe, and Asia. Within each of these continents, these factors and processes interacted constantly. We focus here only on the apparently fundamental elements in each region. In terms of technology, China and the Far East shift in particular from the use of bamboo and cobbles to light blade blanks. During this phase, the general gracilization of the human skeleton and anatomic uprightness, observed simultaneously everywhere, are the result of bipedalism. In Africa an avalanche of autonomous technical inventions took place: from cobbles to bifaces, Levallois to blade production, up to agropastoral Neolithic civilizations and metallurgy. The immensity of this continent made it a sort of laboratory in which innovations and convergences emerged. But, leaving to one side these fabulous and exotic territories, we now focus on an overview of the transition in Europe, itself already quite complex.

Key Issues

For hundreds of thousands of years, the Middle Paleolithic existed in Europe, in an infinite range of environmental contexts depending on time, space, latitude, and solar exposure. However, human populations were continually present, diversifying their cultures, refining their rites, customs, and beliefs. The most extraordinary aspect is the anatomical coherence presented by this enormous fossil population. Abundant in Europe, Neandertals are also found in Asia. They thus appear to have had varied origins probably

combining African and Asian components. Regardless, the biological form of Neandertals is quite uniform. It is identified both by bone morphology and by recent ancient DNA studies. Yet these populations, so homogeneous physically, possessed infinite varieties of cultural traditions, extending from Portugal to the Caucasus. They are differentiated by "styles," or variability in their diet, hunting strategies, and modes of shelter. In a word, the European Mousterians had abstract and metaphysical mental structures equivalent in their refinement to those of later or external populations. It must thus be accepted that a broad ethnic diversity divided Europe, although the demographic and biological basis remained identical. If we consider the vastness of the region, countless cultural phenomena can be observed, simultaneously in their integration and evolution. Europe constitutes a repertory of all human innovations and their dissolution, as much as "progress" as we define it today. Considered retrospectively, we could also argue that these variations (spiritual or technological) were so subtle and so well elaborated that they led to unequaled human survival, a persistence depending on the equilibrium between human needs and natural resources.

This force of equilibrium and this aptitude for permanent renewals can be seen in what appears to be both harmonious and in perpetual balance. Isotopic analyses of fossil proteins demonstrate the importance of meat in the diet, while dental enamel shows the importance of plants, more similar to the diet of primates in general (including humans). Neandertals lived in perfect coherence with nature because nature was never disrupted as a result of their subsistence practices. But social rules imposed during these millennia enabled both the cohesion and articulation of human groups. Human burials and burned, dispersed, and broken bones broadly demonstrate the importance of the subtle and elaborate metaphysical relationship; these rituals illustrate the capacity of thinking, language, and especially a form of conciliation between natural forces and human society. This unprecedented diversification between needs, means, and ethnicities in Europe leads to an essential consequence: the history of the continent is extremely subtle and of extreme complexity. However, the differences seen between them has still allowed the general use of "Mousterian" as an overall term for Middle Paleolithic cultures. Yet this is only a functional, inoffensive, and universal category. Countless cultural traditions succeeded on another over tens of thousands of years and over an immense territory and can be distinguished only by the flexibility in a style, by the inflection of a handle, or simply by systems of sharing food and the social networks in which they existed. Thousands of stone flakes found throughout Europe in extremely varied contexts form the background of a real composite technology, functions, and traditions over time. However, tools, veritable both in its use and in its mythical scope, resulted in contrast from complex assemblages, twisted branches, arm movements, and modes of hafting. Motions are also endlessly varied, both in the sense given to the human action in the different environments they were carried out. Such capacities rapidly became traditions through the interplay of social gratification. But only working edges in hard and brittle materials (stone, shell, antler) alone do not constitute an essential cultural category. Other elements of social behavior must be added, such as habitat, hunting strategies, mythology, and rituals, in order to reconstruct a sort of history of Paleolithic peoples, probably of an extreme fineness since it appears uniform over a very long time.

Changes in the use of stone create reflections and shadows of this constant revolution in concepts.

The simplest flakes (e.g., at the site of Hoxne) demonstrate the broad range of uses for which they were used prior to their abandon: splitting, cutting, sawing, scraping, etc. Countless components were also present in ongoing operation in relation to the rhythms of festivities, ceremonies, traditions, and values. The loss in the historical period is only a drop of water in the ethnic ocean of Europe over hundreds of thousands of years. So, the colored feet of dancers, ceremonies around domestic hearths, decorations of leaves, flowers, tattoos, songs, and dances. A thousand times

dispersed, a thousand times lost. A Paleolithic "history" would be made up of a superposition of "symbolic systems" described by ethnology but here spread over an enormous range of time because all of these populations knew one another, influenced one another, and continuously evolved following certain axes and according to the importance accorded to different elements. Populations, traditions, and periods are distinguished by elements in stone materials grouped under the term "flint." But the general impression offered from stone artifacts leads to the greatest confusion since they are considered out of context and are only incomplete "vestiges." Conversely, evidence exists to indicate organized social life: charred human bones, colorants, etc. One can imagine a swarm of ethnicities spread out across all environments and in constant collective exhibition (arts, games, weapons).

Around 100,000 years ago, the entire world was covered with fossil humans following the same convergent anatomical trends and linked to general uprightness. This process, absolutely generalized, took place everywhere and in the same direction. But very schematically, the universal evolutionary trend varied depending on the isolation of the group, its density, and its demography. Neandertals are only one example among a thousand others where, like polar bears or varieties of horses, the species remained intact, while the morphology (its external aspect) became specialized due to the rate of reproduction and isolation. In other terms, Neandertals were created by extremely long isolation in a backdrop of a huge global population in which all other anatomical forms within the modern human species developed, e.g., Chinese, Kenyans, and Australians.

On these general "mechanical" bases, the human form changed abruptly in Europe between 40 and 35,000 years ago. This was due to the arrival of one of the other human populations to occupy Europe (modern humans or Cro-Magnon). Different non-European anatomical forms had thus followed identical laws of biological evolution, but at different rates, probably due to the lack of geographic isolation (e.g., the steppes of Central Asia) where gene flow was greater than in Europe, such that contrasts were more rapid and more striking. These very early observations, made in the nineteenth century, were particularly striking in academic settings at the time, but the stigma of an opposition between two different populations remains today.

On the margins of Europe, all other populations were in general advancing toward modernity, especially in these regions because population density was higher, spread out, and in constant and distant exchange such that any population could be seen as "modern" if its anatomy had advanced beyond the Neandertals remaining in Europe. This is nothing other than degrees on a biomechanical scale, but there were no biological differences to separate them into different species.

All of these populations were "modern" as a function of their technological development.

From all sides, new population waves penetrated Europe. From the Maghreb (Gibraltar and Sicily), obvious influences can be seen on both sides of the straits: the Aterian ending in the extreme west around 28,000 years ago and the Iberomaurusian in Sicily, identical to that found in Tunisia. Much later, around 12,000 years ago, this invasion of modern humans into Europe is also seen by art, techniques, and navigation.

In Eastern Europe, direct Paleolithic relationships are observed nowhere, despite the geographic proximity of Greece and Turkey. The Aurignacian lithic industry is also present (around 30,000 years ago), but no longer corresponds to the early penetration or pioneer phase (between 40 and 35,000 years ago) and is not associated with a modern form of humanity. This southeastern region should remain an important region for research, not only because excavations are still in progress but also because this transition appears "logical." The Italian industries on curved flakes (Uluzzian) are also found in western Greece and may have had a part in such kinds of movements, if human remains were discovered.

In the question of the MP-UP transition, Asia played an enormous role, probably many times, with several migration routes and different cultural traditions.

The earliest tradition, but the least well known, is called the "Streletskian-Sungirian." Since 40,000 years ago, refined toolmaking techniques

from Central Asia spread directly along the same latitudes to the west. Their expansion, however, remained limited to the current Russian Plain (Sungir, near Moscow; Beroutcha Balka near the south of Russia; and Buran Kaya in Crimea). The associated human remains are clearly modern and are burials. Rituals, weapons, and the bone and ivory industry indicate that they belong to the European Upper Paleolithic. But, although very evolved, these traditions remained exclusively eastern. The rest of Europe was occupied by Neandertals and their Mousterian culture, with immense regional variation reflecting cultural traditions.

The essential axis for total and definitive migration of modern humans into Europe is "oblique": from Iran to Great Britain. All the other coasts, rivers, and valleys seem to have depended strictly on this axis. Art is present in abundance: it shows a seeking for beauty and the incarnation of mythologies, previously mute. Inhabitation sites are very common, with a few burials and bone remains spread across the sites proving the high density of the new population, which probably arrived in successive waves.

This would have been a real colonization on the model of historical societies. Weapons, following the symbol of the image, killed at distance by propulsion (unique to humans) and thus imposed a new symbolism on both reality and the dream world.

This particular "metaphysical" relationship is fundamental to explain the prosperity and permanence of modern humans from then on in Europe. Man sought to impose his will on nature by his spirit (figured mythology), by the conquest of hunting at distance (using spears and bows), and by deregulating the natural biological rhythm of reproduction (less chance for prey, more for humans). Once begun, this cycle is unceasing and exponential: we are today on the threshold of a definitive change with the extinction of everything that is wild (ourselves included) and the definition of increasingly constraining normative rules. Equilibrium thus unbalanced explains current processes. Even if we accord a stronger natural visibility to it, its origin is always and especially spiritual: in the challenges launched by humans to make their own destiny.

Conclusion

The transitions in Europe took place due to the relative isolation of the continent, on which the different Mousterian traditions persisted in complete equilibrium with a changing environment and climate. Conversely, all other regions of the Old World (from Tangiers to Beijing) more readily exchanged techniques, values, and genes. Thus, the "modern" migratory movement, here from Central Asia, is seen in Europe as an abrupt phenomenon in which propulsion techniques, new myths, and gracile anatomy. This was not reflected in specific variations but rather genetic associations oriented toward bipedalism that had begun three million years before. Depending on demographic density, displacements, and contacts, this speed of anatomic evolution varied more or less rapidly although always in the same direction across the world (even today). Only "isolates" such as Australia and Europe followed regional evolution, with an archaic tendency anatomically.

The most curious phenomenon in human history is linked to the intense concentration of these new populations, their density, and then their rapid expansion across all of Europe. Conditions, one could term "triangular," were thus necessary. The new peripheral populations had a very particular relationship with the universe and destiny: they sought to master it. New mythologies were constructed that "enabled" humans to break the sacred link with nature (increased consumption due to thrown weapons), thus leading to increased population size, and to have a tendency for geographic expansion, which explained their rapid mass displacements toward the west. The relationship fundamental to this "transition" is thus found in the way people lived.

This new "self-reading" is evidenced as much in cave art (where myth is embodied), in precise, rapid, and long-distance weapons (spears, bows), in the now extremely abundant and varied burials, and especially by the repulsion of natural forces by "shamans" (tombs, decorations). With the European Upper Paleolithic, people fought against the absurd and forged their own destinies. The difference between such achievements and

those of Neandertals is not in kind but in speed. In a dense and sedentary population, innovations are absorbed into the set of traditional practices (Neandertals). Among modern humans, the population dispersal was much larger (hundreds versus thousands of kilometers), and variations are more common and more diversified. These scattered attempts of singular combat against nature could then be crystallized in a strong and coherent metaphysics in which the place of humans was consolidated, as much by thrown weapons as by mystical images.

At this stage, migrations took place more rapidly and violently as the terrain thus conquered participated in a slow, permanent, and fixed mythology. It was thus fairly simple, by the influx of ideas brought by more "victorious" populations, to weaken the honor render to the animal until it disappeared. Only this spiritual force distinguishes modern humans. This is a solidly structure metaphysical development, of which the population was capable, on the condition that it was rewarded collectively and put into action, as the Bible does today. The spirit justifies all "sacrilege," breaks old laws that held them in another form of equilibrium in a harmonious web of physical and spiritual relationships with a world become "savage" that shifted from the status of partner to that of objects. Once this spiritual crisis was overcome, it offered humanity a new daring and thus a stronger demographic, the "right" to new inventions and the possibility of unlimited expansion. Indeed, the essence of this early modern humanity was the search for cultural inventions (technological, mythological, economic) suitable for overcoming new natural challenges. Such formidable freedom was made for humans out of their own minds. But it is also this freedom that forces us to be responsible for our own destiny and to change it. Finally, it causes the rip (which we still suffer today) between our own natural component and our need for a humanity made by thought. In this direction, modern humans tilted the scales a little more in favor of the mind and a little less for the animal side.

The difference between these two metaphysics was so strong that, in the nineteenth century, the first archaeologists immediately identified the two worlds, either by technology or by art. The metaphysics are as clearly opposed as between, for example, Roman civilization and the Bororos of Amazonia: no spiritual superiority but different scaffolding employed to justified one's place in the universe and to thus authorize all forms of conquest, over nature, other human beings, and finally ourselves.

Between the hasty rummaging in the nineteenth century and the logical coherence now acquired in the historical sciences, the opposition between Neandertals and modern humans can be understood in terms of opposition between value systems. From this depends all other behaviors: displacements, techniques, metaphysics, hunting practices, diet, social distribution, habitat, and education, for example. The operation of all human society possesses a constructive, implacable, and perpetual logic. But the inertia of the history of populations transforms these innovations into a sort of nebulous lineage that characterizes its trajectory. Encounters between populations with profoundly different values, such as Neandertals and modern humans, would cause enormous spiritual shocks, both sides at once and by way of reciprocity and multiplication. While the Aurignacian with Asian origins differs from that in the Dordogne, this difference is less pronounced than within the Mousterian that "absorbed" innovations, integrating them into their own traditions without weakening their specific way of life. All of the potential of modern humans can be already found in other forms during the Middle Paleolithic. What appears vague and disparate among the Neandertals (tools, habitats, burials) becomes clearly defined in a single package along modern humans. This focus and concentration would give them the force and determination to follow this path until the final break with preceding metaphysical systems (Neandertal). This new cohesion would immediately begin an evolutionary line that was chosen and determined and, especially, in perpetual competition with itself. History was born.

Cross-References

- ▶ Crimean Late Middle Paleolithic to Early Upper Paleolithic Transition
- ▶ Demographic Transitions

- ▶ Europe: Early Upper Paleolithic
- ▶ Europe: Mesolithic-Neolithic Transition
- ▶ European Middle Paleolithic: Geography and Culture
- ▶ European Middle to Upper Paleolithic Transitional Industries: A Socioeconomic Approach
- ▶ European Middle to Upper Paleolithic Transitional Industries: Châtelperronian
- ▶ Middle East Middle to Upper Paleolithic Transitional Industries
- ▶ Northern Europe: Middle to Upper Paleolithic Transition

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Europe: Paleolithic Art

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Introduction

In the western peninsula of Eurasia, Paleolithic art is particularly concentrated and is the earliest. It would appear that the migrations of modern humans from the East had to "mark" the geographic extremity and their new territories. Such materialization of oral myths guaranteed their reality and performance by adding the harmony of plastic forms. Based on the opposition between two systems of thought (Neandertal and Cro-Magnon), graphic imagery rendered this difference in supernatural substance and accentuated the two metaphysical worlds. "Images" are not absent during the Middle Paleolithic (Neandertals) in Europe, but follow entirely different paths from that of plastic illusion. Their burials and habitats have remains with a natural connotation, much more realistic than any later images: horns, antlers, skulls, and mandibles, isolated in tombs, designated the animal symbol, status, and the perpetuity of the deceased, like nature itself to which humanity associates its own destiny. "Hyperrealistic" images are also included in the inhabited areas via isolated bones or exotic minerals such as colorants, sparkling minerals, and mineralized marine shells in early geological deposits.

With the Upper Paleolithic in Europe, a profound separation is made between animal trophies and their "illustrations," being the extraction of their real contour put to the service of mythical thought. This is a deep and moreover irreversible spiritual change: the entire history of art begins here, between 40 and 35,000 years ago, and continues today. So, Paleolithic art first sheds light on the power, cohesion, and harmony of thought. Even if these codes remain nearly indecipherable, their importance is demonstrated by the works produced. Not only do these series of images evolve, by becoming rooted in turn to each other, each phase in this history of forms presents obvious coherence, attesting to highly coercive laws governing the most precious collective thought and its different modes of expression. From time immemorial, human societies were (and remain) united due to a metaphysical explanation that justifies their presence in the eternal reign of the universe.

Everywhere applicable, these spiritual operational rules for humanity are expressed through an extreme variety of formulas, across space and time, but according to constant mechanisms. The laws of the image, freed from the relationship to oral myths, then reflect autonomous histories, where art and artists follow an increasingly independent lineage in relation to the theoretical concepts that they created. The reproductive process is thus reversed: from producer of images that the mind envisioned first, it becomes determined by their harmony and coherence. This occurs as for writing: starting with letters formed by schematic images, which lose their meaning, later the most sublime texts are produced, from Aristotle to

Balzac, without anyone having the idea to reduce these works to the structure of the schema of the images that were originally realistic (e.g., the letter A is an inverted steer head).

A similar trajectory animates the entire history of plastic forms, increasingly dissociated from the original mythological abstraction, as if this history of form tended to orient ideas rather than to illustrate them. For example, the introduction of realism in animal images, then human silhouettes, guided the spirit of man to be more daring by forging their own destiny: this is the Neolithic. As art introduced humanity into the supernatural forces that determine us, craftsmen, peasants, and herders became masters materially of the earthly life as well. This final part of the history of art (extending until 1850), relative to producing and conquering peoples, will not be discussed here.

Paleolithic art is in effect limited to the periods and situations (even today) in which human societies were intimately integrated with nature, by limited plant gathering, occasional hunting, light shelter, regular movement of ethnic groups in the landscape, and, principally, the arts and dreams that they evidence. Paleolithic art thus responds to this situation of harmony with nature by adding its uniquely human dimension: plastic beauty. For us as well, only such extreme sensitivity of the disappeared artists still "speaks": their creations were spiritual vectors prior to their creation, becoming carriers of aesthetic messages and magical power to fascinated humans today.

Thus this spontaneously felt emotion immediately classifies them in the domain of the arts, although the initial assumptions considered this early humanity as cave dwellers, mammoth hunters, and competitors of hyena and bear.

Key Issues/Current Debates/Future Directions/Examples

Distribution

On a global scale, all of the regions that experiences or are still experiencing hunting ways of life also show artistic activities. They are presented in varied forms but always evidence the same fundamental tripartite relationship: integration with nature, oral myths that justify such integration, and plastic expressions occurring at the intersection of the first two, like harmonic evidence of these articulations. The arts of hunters are recognized so surely that their radiometric dates appear unnecessary. Because they immediately reveal this form of tension between assumed natural constraints and the flexibility of spiritual means used by the artist to harmonize human society and the part of the universe with which it is confronted.

For Europe, evidence of mobile art was spread everywhere man had access, being the territory of the continent and less so the areas covered by glaciers (Scandinavia) and more the marine expanses that were exposed by the low sea level (North Sea). These mobile arts accompanied humans as they moved across the landscape, from habitat to burial, where their symbolic values took their power.

But parietal art, the most sumptuous, is found particularly in southwest Europe (Spain, France, Italy), very curiously concentrated in rocky regions, although the rest of Europe also had countless caves and intense human occupations. Some parietal art has been found in the Ural Mountains and the Carpathians, considered quite important as it was isolated and reflects regional plastic codes. The painted cave recently discovered at Coliboaia (in the western part of the Romanian Carpathians) exactly reproduces the figures proper to the Western Aurignacian. It thus proves once again the extreme geographic extension of European civilizations during the Upper Paleolithic.

Categories

The Paleolithic images were above all mental creations, produced by a single mind, in response to social functions of a sacred nature. We can readily see mythological expression, magic, and initiations, for example. The plastic "images" were therefore probably accompanied by ephemeral events, as what took place around the world and through time: dance, music, song, disguises, masks, tattoos, and body painting. It remains however that to survive, the plastic work must create

emotion as much as it was the product of emotion: Lascaux "speaks" to us as much in the absence of its original mythic context as through mythical fragments. The fact alone that these Paleolithic works of art number today among our cultural monuments demonstrates the power of this fascinating mystery that plunges us to the depths of our own self-questioning.

Nonetheless, like modern populations who remain in harmony with nature, indirect evidence of personal decorations sheds light on the opacity imposed by the passage of time. The preserved statuettes open perspectives on the emphasis given to ritualized costumes: belts, hair styles, and disguises. Such mobile art thus constitutes both tridimensional plastic realizations, essentially feminine, and evidence of ritual values. In parallel, some decorative objects were also found, either scattered across an occupation site or preserved in original position with the dead. Countless "pendants," colorants, and animal trophies indicate the complexity of dress codes. Similarly, we have a new series of works of art, sometimes tiny but very carefully engraved and sculpted: animal heads, striated and perforated teeth, beads, discs, and rings made of mammoth ivory. The intrusion of the natural mythology is also seen in zoomorphic statuettes: horses, bison, mammoths, and lions, for example. The symbolic possession imposed on living nature takes all its power here via the reduction of the real model to small dimensions, manipulable, transportable, and extracted from its wild context to become part of the ritualized domain. These images, in three dimensions, were chosen and reproduced and then spread across social space and in the claimed places, forming from then on an element of the message between man and the absurdity of his destiny.

This mythic veil is also imposed on craft objects whose utilitarian function would seem to be predominant: knives, spatulas, lamps, and spear throwers, for example. With these, we simultaneously have two complementary means of accessing mythical thought: changing the world via the mechanical laws defied and the abstract component with which this act is invested due to the superimposed image. On a purely plastic plan, a strict harmony joins form and function: the bison head wrapped spontaneously around a perforation hole, fish aligned with handles. Sometimes certain mythical elements (mythemes) are concentrated on the massive ends of spear throwers (the "bird fawn" of the Pyrenees). Such formal play, in which dream is associated with action, is found in all societies where motions remain free and where the two fundamental human functions have not been separated, that is, everyone except our own. In traditional societies, there is no tool, however humble, from a hollowed bowl to a decorated shelter that is not touched by this tripartite equilibrium, instituted between the technological formula determined by tradition, the spiritual function justified by metaphysics, and the natural context in which the two functional modes are fulfilled. Bags, quivers, basketry, village structure, or religious delegation all respond to a single metaphysical formula with which a given population identifies and is reassured.

Physically intermediary between the statuette and the decorated cave wall, engraved stone or bone plaquettes are found in shelters, organized like transportable scenes. Their thematic specialization is added to a relative stylistic autonomy vis-à-vis the monumental "life of forms." They have more liberty perhaps because there is less seriousness in the weight of this art, somewhat like decorated tools or our country chapels in comparison with the dogmatic coercion corseting our city cathedrals. To the unusual animation, the engraved plaquettes at Gönnersdorf (Germany) respond the circulation distribution of painted plaquettes at Dalmieri (Italy), prolonged by the entire range of human illustrations; the most prosaic on the engraved plaquettes at La Marche (France); or the countless plaquettes decorated by the liveliest imagination at Enlène (Pyrenees) to the plaquettes at Parpalló (Spain) with marked Solutrean spirit. The monumental bones at Mézine (Ukraine) have schematic painted decorations, forming an authentic "parietal art" in the strict sense, that is, structured by the wall of the shelter, this time built rather than chosen, like a cave or rockshelter. Mobile art, made on transportable plaquettes, presents a total intellectual

revolution vis-à-vis sculptures because the reduction to only two dimensions forces the spirit to use one's imagination in order to reconstruct the whole volume of the being suggested by its contour alone.

These different formulas, from flat to three-dimensional, were then transposed to selected fixed locations on cliff faces, rocky overhangs, and caves. There we find the entire range of plastic modes of expression: clay models (bisons at Montespan); stone bas-reliefs barely connected to the walls (horses at Cap Blanc); fine engravings like nervous lines of an artist (Les Combarelles); flat paintings, like the colored spots giving substance to contours (Cosquer); gradations creating volume (Font-de-Gaume); contours drawn in red or black (Pasiéga, Covalanas, Niaux); and up to the majestic polychrome frescos (Lascaux, Altamira, Chauvet).

The rocky supports themselves vary from slabs facing the landscape (Foz Coa, Siega Verde), rockshelters in which daylight animates the reliefs (Le Roc-aux-Sorciers, Angles, Gorge d'Enfer), and the innermost depths of mysterious chambers, formidable, damp, cold, and completely dark, where the loss of landmarks upsets the spirit and disposes it to receive sacred myths (Niaux, Chauvet, Cosquer, Lascaux).

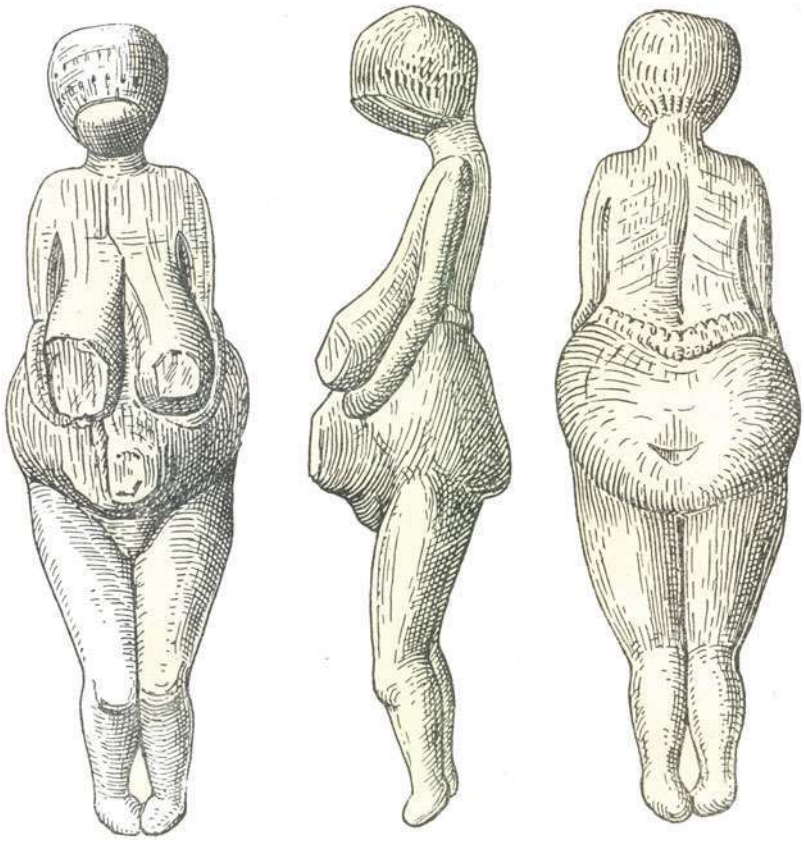
All of these formulas, along with their infinite varieties, express both the religious complexity, irreducible to a single story, and the proliferation of artistic modes of expression, combined in strict coherence. From the tool made sacred as much by its decoration as its function to profound sanctuaries, cadenced by the successive chambers, rocky accidents, and messages grafted by progressive rhythms, the entire Paleolithic soul is inspired, expressed, and based on the same spiritual lineage: that of an attempt to obtain harmony with nature, slowly shifting to an ambitious desire to place humans, increasingly conquering by technology, migrations, and especially his influence, through realistic imagery, above the world of creative forces that he believes dominate. The end of the history of forms, tens of thousands of years later, sees indeed the trend to realism, i.e., disembodied, return, and be confirmed; the increasingly animated figures being of animals made banal, while allusions to humans themselves appear frozen and exposed (Figs. 1, 2, 3, 4, and 5).

Iconography and Schematization

The range of images in the European Paleolithic focuses especially on the large glacial fauna, essentially horse, aurochs, reindeer, bison, mammoth, woolly rhinoceros, and bear. These species were chosen from the natural environment, but were not always those actually consumed. Their choice reflects rather their ability to reconstruct a mythical world clearly based on the relationships between animal and human societies. The species selected and represented also vary more and differently than the environment itself, either according to the periods considered or the geographic areas where art developed. This is really the embodiment of the unreal, with distant and distorted relationship to the lived reality. Similarly other more recent forms of art, where the symbolic role played by allusion to forms extracted from lived experience, place them in an entirely different sphere of thought, like the Athena's owl, Diana's deer, Hercules's feline, or the Christian lamb.

During the European Paleolithic, certain animal species dominated depending on the stories they offered, including the felines at Chauvet, the mammoths at Rouffignac, the bisons at Font-de-Gaume, and the aurochs-horse pairs at Lascaux. These preferential representations cross technical constraints, from sculpture to painting passing by drawing and engraving, and the vastest regions having a single cultural tradition. Spatial and mechanical challenges always give way before the gravity of the religious schema to which the consciousness of a group is attached.

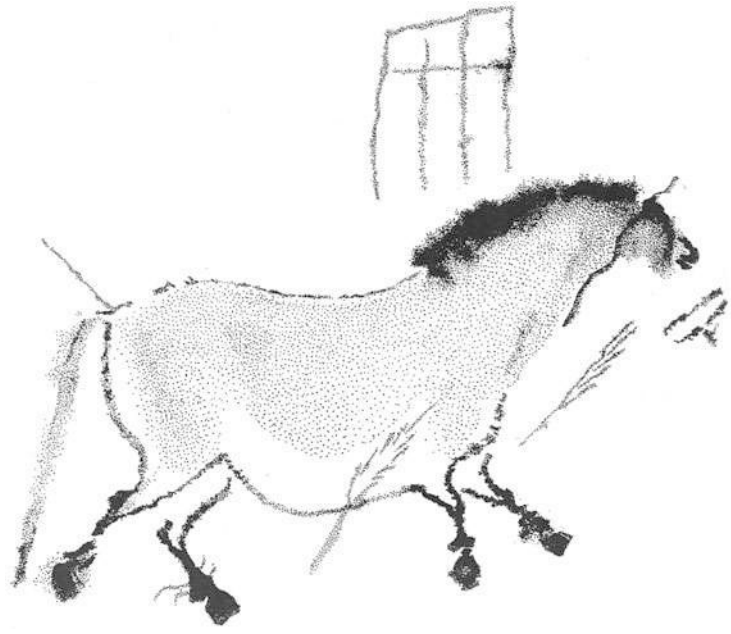
Alongside animals appear rare human figures, mainly in two forms. Feminine representations are found sporadically in Paleolithic aesthetic-religious fields as sculptures, paintings, or engravings. The most spectacular and most widespread are found in the Gravettian tradition in which images of seated women were made in the form of statuettes across Eurasia from the Pyrenees to Irkutsk near Lake Baikal in Eastern Siberia (Malta). The opulent forms (breasts, hips, thighs)



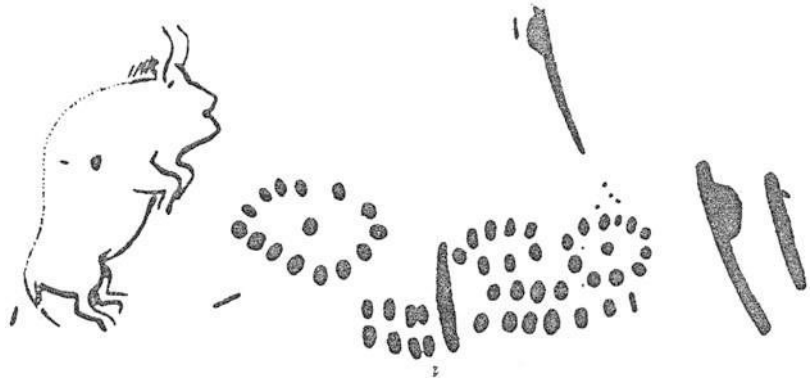
Europe: Paleolithic Art, Fig. 1 Feminine figures appear regularly during the European Paleolithic, but according to highly stereotypes plastic formulas. By waves, they periodically submerge the Eurasian steppes, manifestly carriers of distinct meanings since the graphic formulas continually change. Here, at the start of the period, these "women" are obese, naked, and without faces. This iconographic model crosses all mechanical laws imposed by the different supports: modeled clay, soft rock, ivory, calcitic crust, bas-reliefs, paintings, and sculptures. The "laws" of style were also the most constraining (Kostienki, European Russia, Gravettian, c. 23,000 years ago)

and the lack of facial representation suggest the existence of a clear stereotype defined by religious thought and may indicate preoccupations linked to the fertility of the group and its resources. A second series of feminine images developed during the Late glacial (15–12,000 years ago). These are rather curved contours and profiles of young women, even as statuettes reduced to a limited contour (Nebra, Gönnersdorf, Monruz). Since these silhouettes are also known on cave walls in Aquitaine (e.g., Les Combarelles), their extension as mobile art across Europe seems to follow the movements of territorial reconquest by Magdalenian populations in rapid demographic expansion after the Last Glacial Maximum. Whatever the meaning, these silhouettes clearly evidence the importance of this symbol during expansion, somewhat like we see the symbols of the Christian cross "come down" from churches to be carried as a crucifix, as mobile as the missionaries themselves.

Masculine forms increase in frequency but are masked, transfigured, strange, or hidden beneath animals. These ambiguous appearances are related to the fear of magical influence exerted by the image on its real model. Regardless of the meaning of these representations, they could not affect the existence of their own creator, who appears there in a protected, hidden, and allusive aspect. Animal disguises that they seem to wear directly reflect shamanic practices in which some beings could enter the supernatural world of the spirits where their will affects fundamental natural forces and where they can influence action. Such practices and concepts, universal among peoples in harmony with nature, often involve plastic expressions intermediary between humanity and animals. Indeed, any animal embodies, in the mind of humans, the essence of vital strength because their reactions, as in physiology, have powerful similarities with ours. The feeling of opening toward these deep abysses would be



Europe: Paleolithic Art, Fig. 2 Natural forms undergo distortion due to the laws of dreams. The "real" animal is that which takes its source in the myth and conforms to it. The interplay of signs, encoded with meaning, is assembled in perpetual arrangement, from the image to the schema (Lascaux, Dordogne, France, Magdalenian, 18,000 years ago)

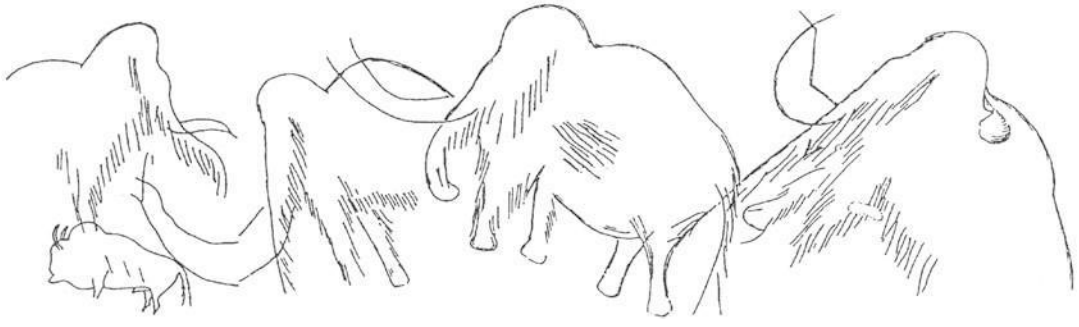


Europe: Paleolithic Art, Fig. 3 The "plastic phases" present a prodigious complexity during the European Paleolithic. Abstract signs (*points*, *lines*), schemas (women), and ambiguous representations (bison upright like a human) are associated to create syntactic groups on rocky reliefs at strategic points. Here, all these indications were brought in to highlight a deep gallery at the beginning of the decorated areas, thus sanctified by mythic processes (Niaux, Ariège, France, Magdalenian, 14,000 years ago)

clearer and stronger when the image in which it is found enters in proximity and esteem. The lion man of Höhlensteinstadel (Southern Germany) or the bison at Trois-Frères (French Pyrenees) summon as much the idea of formidable but mastered power as that of a physical analogy with humans, thus assumed by the image embodying this complicity.

As for the Paleolithic "life of forms" (H. Focillon), this does not always tally with a realistic illusion, but holds a subtle dialogue with the visual suggestion, passing by the schema, an extreme graphic reduction, like our alternative transitions of an alphabet in capital letters or in cursive. There is not progression from one form to another in the chronology, but we note concomitant use of one or another form of plastic expression corresponding to expressive mode, qualifying the visual discourse. These contractions of signs, illustrated in our original

Europe: Paleolithic Art, Fig. 4 The thematic associations were loaded with evocation resulting from dreaming, never from observed reality. The fundamental theme illustrated here groups bison and horse, like the ass and cow in the Christian nativity scene, also charged with strong symbolism (Le Gabillou, Dordogne, France, Magdalenian, 18,000 years ago)



Europe: Paleolithic Art, Fig. 5 Parades, barely evoked, suggest a moving mass, as if through a mist. But the code appears suddenly by the frontal opposition of an individual walking away and by the introduction, drawn from dreams, of a bovid filled with lines. All mythical thought is contained here, by a vague illusion to a reality employed as a pretext, immediately transposed into a supernatural world, the extreme reference to material life

pictographic alphabet (the letter A is an inverted steer head), enrich and condense considerably the semantic variations of Paleolithic art. The values of genres slide from a sexual representation to schemas of an extreme sobriety due to which they enter into easy dialogue with all other forms of images, as today we have hearts pierced by arrows or medical signs with distant allusions to men and women. Bison heads, associated with perforations (dual feminine value), are maintained in a given place, but they lose their plastic substance, become distanced from the analogy with reality but manifestly preserve their symbolic value. This is similar to the sign of the cross in Christian gestures, an extremely abstract codification that carries with the same force as its distant model in Golgotha, the redemptive power to which the believer aspires and can attain by the humble hand movement. Such processes of iconic reduction also affect, for example, images of horses (reduced to a succession of right angles), ibex (series of interlocked V's), and bovids (horns only in the form of a U) and introduce a dense and structures dialectic used simultaneously as a formal condensation on small tools and on huge wall compositions (Lascaux).

Morphemes

The plastic images of the European Paleolithic play and utilize frequent formal games in textural, spatial, and temporal domains. The texture of the images derives from the fineness of the engraved line and the voluptuous models provided by graduated tones, the harmony between colors, and reflections of sparkling light. Fundamentally, the Paleolithic images hold a subtle dialogue with the underlying stone on which they are made: the support gives these forms their grain, velvety texture or hardness, their contour, curves, and movements.

Animal parades, with careful structuring, extend along the walls, benefiting from the natural architecture, reliefs, crevices, and flaws. We thus see the articulation of the mythical message combined with that of the cave. The chambers are opened, shrink, plunge, or climb by offering life to the images that they transport. Manifestly, the relationship between the plastic sign and the support on which it is made was so strict that we can no longer distinguish one from the other, as if the message of the whole is validated only by this dynamic equilibrium between the mystical and the cavern, definitively joined.

Morphemes in which images were immersed in time abound, during certain periods, in certain messages, to end by dominating at the end of this series of aesthetic-religious experiences, when desanctified art became oriented toward the accurate reproduction of reality in both details and movements. Time was injected by attitudes, raised hooves, turned heads, moving tails, alignments, falls, and flowing blood. Many times, the contraction of time is expressed by the superimposition of successive movements made in real time. A shift then took place between the contraction in a single space of action in successive times (Chauvet, Foz Coa, Lascaux). Close to the lived reality, the animation from the real world does not meet the authentic aspirations of Paleolithic art, always oriented toward the evocation of another world, situated beyond and above the real world. In its essence, art was thus used for the imaginary in which humanity was projected and where the immobility of living beings participated in the persistence of this daring by which, once again, humanity defies its own condition and biological destiny. By these means and through time, awareness has led humans to disengage from their nature toward sources of change where his arts are emerging and seek to appease him.

Composition and Semiotics

The organization of aligned figures gives the key to the structures dreamed by Paleolithic man. Most of the time, the articulation of mythical messages remains clearly susceptible, even if reduced to a binary disposition. Often it is found organized around natural rocky elements, such as a fissure, protuberance, or an alcove. The intimacy between natural contexts and added motifs is again powerfully felt. The scene uniting the deer of Lascaux crossing a river with their necks held high takes its meaning once created on the rocky gorge on which the gaps suggests the torment of the water. The simple choice of panels, for their brightness, exposure, delimitation, position and texture, forms the first step in this structuring approach.

These interpretive lines, imposed on the eye by the spatial organization of their themes, force thought to follow its own story imprinted in plastic arts, images, and rock combined. The sequence of chambers, their distance from daylight, total obscurity, oppressive dampness, and low temperature condition are the soul for the reception of founding myths as to the justification of the group and the mysteries with which all conscious existence is confronted. The solutions were there, revealed as soothing, real with respect to the dangers of the path taken into the cave, and unreal with respect to the secrets of life, all combined in a dazzling of physical and spiritual senses. Gothic windows do nothing other than seduce in order to convince. And the temples of Science are even more suspect of soliciting, with their columns, tympanums, porticos and statues from Antiquity.

The revelations contained in the depths of damp dark caves harnessed the suspended conscience, by adolescence as much as by the dangers overcome. But the solutions were there, in the trembling illumination on the damp walls with bright vivid colors. Their harmony, linked to the scale of forms, gigantic and dancing figures, came

literally out of the darkness and anguish. The revelation of the mysteries of existence was accorded by the seduction stimulated by the rhythms, color, and strangeness. Paleolithic art, like man who overcame the challenges of earthly life, also contributes one of the culminating points in the spiritual adventure of civilization.

Cross-References

► European Upper Paleolithic Rock Art: Sacredness, Sanctity, and Symbolism

Further Reading

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Europe: Prehistoric Rock Art

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Introduction

In its broadest sense, the term prehistoric rock art covers the whole of graphic manifestations affixed by prehistoric humans on rock surfaces of all kinds. The surfaces can be rocks out in the open air, walls protected by shallow rockshelters, or deep cave walls in total darkness. For deep cave situations, the term "parietal art" is often used, but these two terms cover the same reality. The phenomenon is widespread throughout the world, as it meets the basic needs of preliterate human societies. In Europe, prehistoric rock art extends from northern Norway to Andalusia and covers more than 30,000 years, from the Upper Paleolithic to the Roman conquest. As a result, it responds to an infinite number of motivations depending on beliefs, systems of social organization, and types of subsistence economies. In formal terms, it uses a wide range of techniques (engraving, sculpture, finger strokes in clay, line drawings, monochrome or polychrome painting) and a wide range of styles (from figurative naturalist art to schematic and to geometric abstraction). Although the word art is sometimes criticized because of its contemporary connotation, it is difficult to escape the idea that the human groups who made rock art were pursuing, in addition to the basic motivations that animated them, an undeniable aesthetic quest, even if it sometimes diverges from our own criteria.

Historical Background

In the nineteenth century, there was little acceptance of the aptitude of prehistoric people to paint and engrave images onto rock. The idea of the "primitive savage" perpetuated for a long time and prevented the acceptance of the full intellectual capacities of societies before history. The remarkable bison paintings on the ceiling of Altamira, discovered in 1879, were not officially recognized as a prehistoric work until 1902. There is no doubt that the aesthetic, naturalism, and polychrome character of these figures impeded this recognition. It was not until the second half of the twentieth century that paleoanthropological approaches to rock art meant that rock art study could acquire the status of a scientific discipline within prehistoric archaeology. Today, rock art is considered a precious tool with which to address the cultures and the ideological and symbolic universe of hunter-gatherer, then herders and

farmers societies who succeeded on the European territory. The need to leave a lasting mark of one's culture on monumental mediums is universal. Only the forms and locations that were selected to practice this exercise change with the subsistence economy and the prevailing systems of thought.

In a report presented to UNESCO in 1984, the number of individual rock art graphics in Europe was estimated at four million (Anati 2003). This number has easily been surpassed today. Paleolithic art alone counts for more than 360 sites, with recent discoveries of major scientific interest in France (Chauvet in 1994), Portugal (Foz Côa in 1994), and Spain (La Garma in 1995). The debate is no longer about the authenticity but rather about the chronocultural attribution of these works, given the difficulty of absolute dating.

Key Issues

Paleolithic Rock Art

General Points

Paleolithic rock art occurs throughout the Upper Paleolithic, beginning c. 35,000 BP (or earlier) (with the arrival of *Homo sapiens sapiens* in Europe) and ending around 12,000 BP, shortly before the end of the glacial period. The oldest figurative works, attributed to the "Aurignacian" culture, are the statuettes of Swabian Jura (Germany) and the parietal paintings and engravings on the caves of Fumane (Italy), dated between 32,000 and 36,500 14C BP, and of Chauvet (France), between 30,000 and 32,000 14C BP (radiocarbon dating strongly underestimates calendar ages).

Paleolithic art is fundamentally an art of animals: human representations are rare and are most often caricature-like, in contrast to animals which achieve a sometimes striking realism. Numerous nonfigurative drawings or "signs" complete the iconography. Deep caves, invested since the beginning of the period, remained the most popular places until the end, to the extent that we sometimes speak of "cave art," even though engravings and sculptures also decorated occupied rockshelters, and that rocks exposed to the open air have also recently been discovered in Spain and Portugal.

An in-depth examination reveals deep regional thematic and stylistic differences and significant changes over time across Europe. Several models of relative chronology, based on archaeological data, superpositions, and stylistic sequences, have been proposed. Those of Henri Breuil (1952) and André Leroi-Gourhan (1965) are the better well known, but new methods for direct dating by accelerator mass spectrometry and also recent discoveries like the Chauvet Cave have forced a reconsideration of the chronostylistic models based on the assumption of a linear evolution leading from an original schematic form toward better controlled realism. Some advances and setbacks, phases of invention, and regression have crisscrossed over these 20,000 years and provided a more complex schema.

Iberian Peninsula

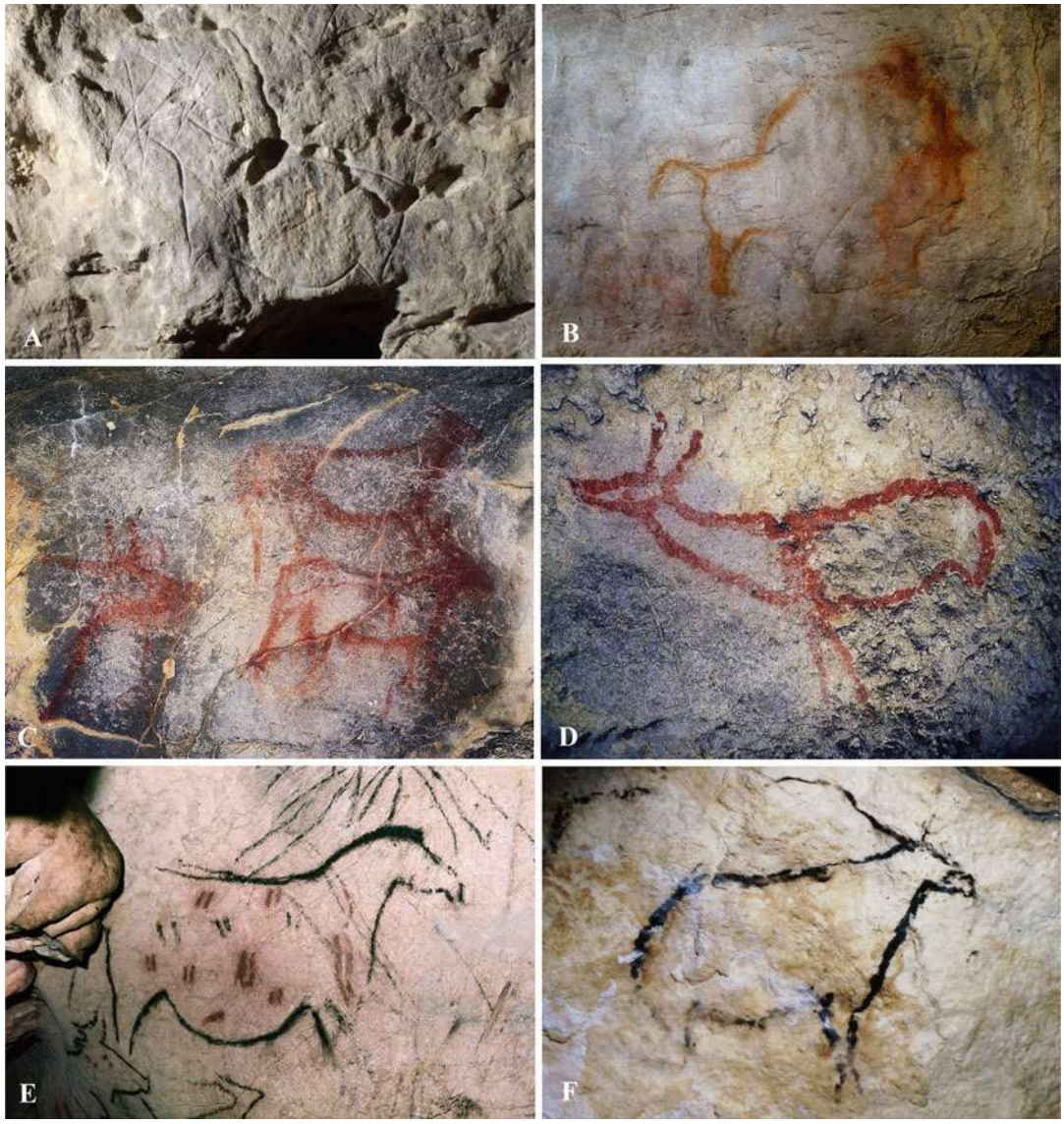
In the extreme southwest of Europe, the Iberian Peninsula retains evidence of intense graphic activity during the Upper Paleolithic, with more than 200 parietal assemblages distributed in all regions, not including the many portable art objects (Bicho et al. 2007). The most important concentration is that in the Cantabrian region, a narrow strait between sea and mountain, open at its eastern point toward the southwest French region, which contains around 120 decorated caves covering all the periods of the Upper Paleolithic (Collective 2002; González Sainz et al. 2003; Ríos González et al. 2007). Centers, such as Peña Candamo, Altamira, El Castillo, and La Pasiega, have played an important role in the history of research on Paleolithic rock art. Other regions on the peninsula, which had practically no parietal evidence around 30 years ago, today present important concentrations. We can cite among others the spectacular rock outcrops in open air in the Duero valleys (Domingo Garcia, Siega Verde, Mazouco, and specially the 27 sites along the Côa River), Tagus (Ocreza), and Guadiana (Molino Manzánez) (Baptista 2009). To these open-air sites, several caves need to be added: Escoural in Portugal, Maltravieso in Extremadura, and in the

interior of the peninsula, some cavities in the foothills of the Central and Iberian systems (La Griega, Los Casares, La Hoz, El Reno, etc.). In the Mediterranean area, today several small ensembles can be counted (Meravelles, Cova Fosca, the group of Cieza, El Niño) and isolated parietal representations (Parpalló, Reinós), without forgetting the engravings in daylight of the En Melià shelter (Castellón) (Mártinez-Valle 2006). Finally, in the extreme south, Andalusia has about twenty parietal sites in caves or rockshelters: La Pileta, Ardales, Malalmuerzo, El Morrón, Ambrosio in the interior; El Moro and Palomas near Tarifa; Nerja, Navarro, Victoria on the coast of Málaga; and a single open-air site (Piedras Blancas).

Figurative graphic activity spread in the Iberian Peninsula like an oil stain, affecting diverse territories and subject to highly variable environmental conditions and resources. The phenomenon began with the Aurignacian (at least in the north: La Viña rockshelter, early phases of Castillo) and is present at the southern end (Tarifa group) from the Gravettian (Fig. 1). Paleolithic art from the Iberian Peninsula is fully integrated with that of Western Europe and presents the same two formal conceptions of the animal figure, a conceptual naturalism, minimalist, in the early phases (figures reduced to a contour with very few details and internal elements) and, from 17,000 BP, a more visual naturalism, attentive to anatomical details, with a more successful treatment of volume (infills and internal details, correct perspectives of limbs and horns). However, art from the Iberian Peninsula shows notable singularities such as engraved rocks in open air in the valleys of Atlantic rivers with large-size figures produced by pecking (Fig. 2). With few exceptions, paintings are only preserved in deep caves. Additionally, more temperate climatic conditions than in the northern regions of Europe brought about a distribution of rich fauna including horses, aurochs, stags, does, and ibex with a gradient from north to south: in the Cantabrian region, in addition to this fauna, bison and reindeer (mostly during the Magdalenian) and some very rare mammoths and megaloceros can be found. By contrast, bison and reindeer are exceptional in the two sub-plateaus and completely absent from Levant and Andalusia.

The strong compartmentalization of the territory due to the mountainous character of the peninsula presents other differences that cannot be explained by climatic reasons, such as the distribution of abstract signs (particularly abundant in the Cantabrian region and Andalusia) or the proportion of stags and does, which is very contrasted depending on the region. Similarly, the stylistic changes during the Upper Paleolithic do not follow the same models in all regions. The case of the Cantabrian region is very distinct in this respect because of its interactions with southwestern France, particularly intense during certain periods (central and final phases of the Magdalenian; cf. Fig. 3), and more restrained during others (during the glacial maximum and its extension in the older Dryas where the Cantabrian region showed a high artistic personality). Other peninsular regions (Levant, Atlantic face, and even Andalusia) present a greater continuity from the graphic point of view, with less modification over time. In these regions, the Gravettian and Solutrean conceptions continued with very little change in the Magdalenian. These regions show some similarity in the graphic conventions, which indicate real interactions between them. These are also confirmed by the extension of some elements of the lithic weapons such as the stemmed and eared arrowheads, which are known in the Solutrean of Levant and Portugal.

Decorated objects (portable art), during the Upper Paleolithic, are strongly associated to rock art but their distribution is strongly conditioned by the conservation of organic material, more favorable in caves (Cantabrian region, Ebro valley, and north of Catalonia) where a diversified and conventional portable art is known. On the Atlantic coast, in the northern sub-plateau and on all the Mediterranean coast, mostly objects in stone can be found such as the collection from Parpalló (Valencia) including thousands of engraved and painted plaquettes distributed throughout a long sequence going from the Gravettian to the Magdalenian and, consequently, with a great interest to conduct a diachronic and comparative analysis with the regional rock art (Villaverde 1994).



Europe: Prehistoric Rock Art, Fig. 1 Parietal art of the Upper Paleolithic in Spain. (**a**) Santo Adriano (Asturies). (**b**) Castillo (Cantabrie). (**c**) La Garma (Cantabrie). (**d**) Covalanas (Cantabrie). (**e**) La Pileta (Málaga). (**f**) Nerja (Málaga). (Photos: G. Sauvet (**a**, **f**); C. Fritz and G. Tosello (**b**); C. González Sainz (**c**, **d**); J.L. Sanchidrián (**e**))

France

France is home to 167 caves and shelters attributed to the Upper Paleolithic. Animal motifs constitue the larger group of representations. In general, herbivores dominate (equines, bovines, caprine, cervid); carnivores (bears and felines) are more rare as are humans and anthropomorphic figures. The proportions vary from those of consumed fauna, as it involves iconography linked to myths and beliefs and not directly related to daily life.

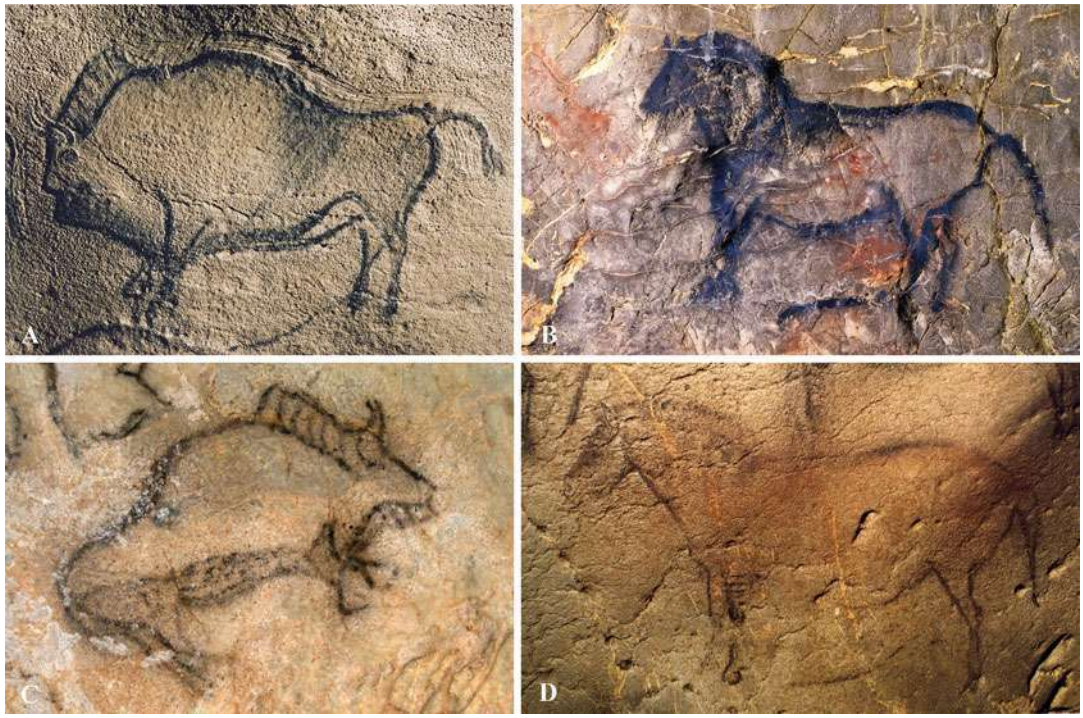
The sites related to the first culture of the Upper Paleolithic, Aurignacian, are very rare and often reduced to a state of relics. This makes the discovery of the Chauvet Cave (Ardèche) even more exceptional. The technical quality and the conservation of these painted and engraved representations (felines, rhinos, mammoths, horses, bison,

Europe: Prehistoric Rock Art, Fig. 2 Paleolithic art on rocks in daylight on the Iberian Peninsula. (**a**–**b**) Foz Côa (Portugal). (**c**–**d**) Siega Verde (Salamanque). (Photo: G. Sauvet)

ibex, bears, etc. in descending order) have cast doubt on their age despite the argument of the eight consistent direct radiocarbon datings. In Dordogne, it is more than likely that parietal art must have flourish in shelters that have unfortunately collapsed (Blanchard and Castanet rockshelters).

The following period, known as Gravettian, sees the rock art phenomenon increase and extend from the north of the Loire (Mayenne-Sciences, Arcy-sur-Cure) to the Pyrenees (Gargas) passing by Dordogne (Cussac) and Quercy (Pech-Merle, Cougnac) (Fig. 4a–d). The Cosquer cave, today immerged under 30 m of water near Marseille, belongs to this formal universe. The represented fauna are again more or less the same as in Aurignacian: mammoths and megaloceros are omnipresent. Apart from exceptional representations of "wounded" men struck by multiple strokes (Pech-Merle, Cougnac, Cosquer), humans are represented by the bas-reliefs of Laussel, with the famous "woman with a horn" which is related to the immense trend of feminine representations with opulent forms whose hundreds of statuettes have circulated in Europe between 25,000 and 23,000 BP. Another original theme, typical to this period, is that of negative hand stencils produced by blowing pigment around the hand applied to the wall. This motif saw a considerable expansion from the Yonne valley (Arcy-sur-Cure) to Andalusia (Ardales), through Extramadure (Maltravieso), the Cantabrian region (Castillo, Fuente del Salín), the northern and southern slopes of the Pyrenees (Gargas, Tibiran, Fuente del Trucho), Quercy (Pech-Merle), Provence (Cosquer), and even Italy (Paglicci), to name only a few major sites.

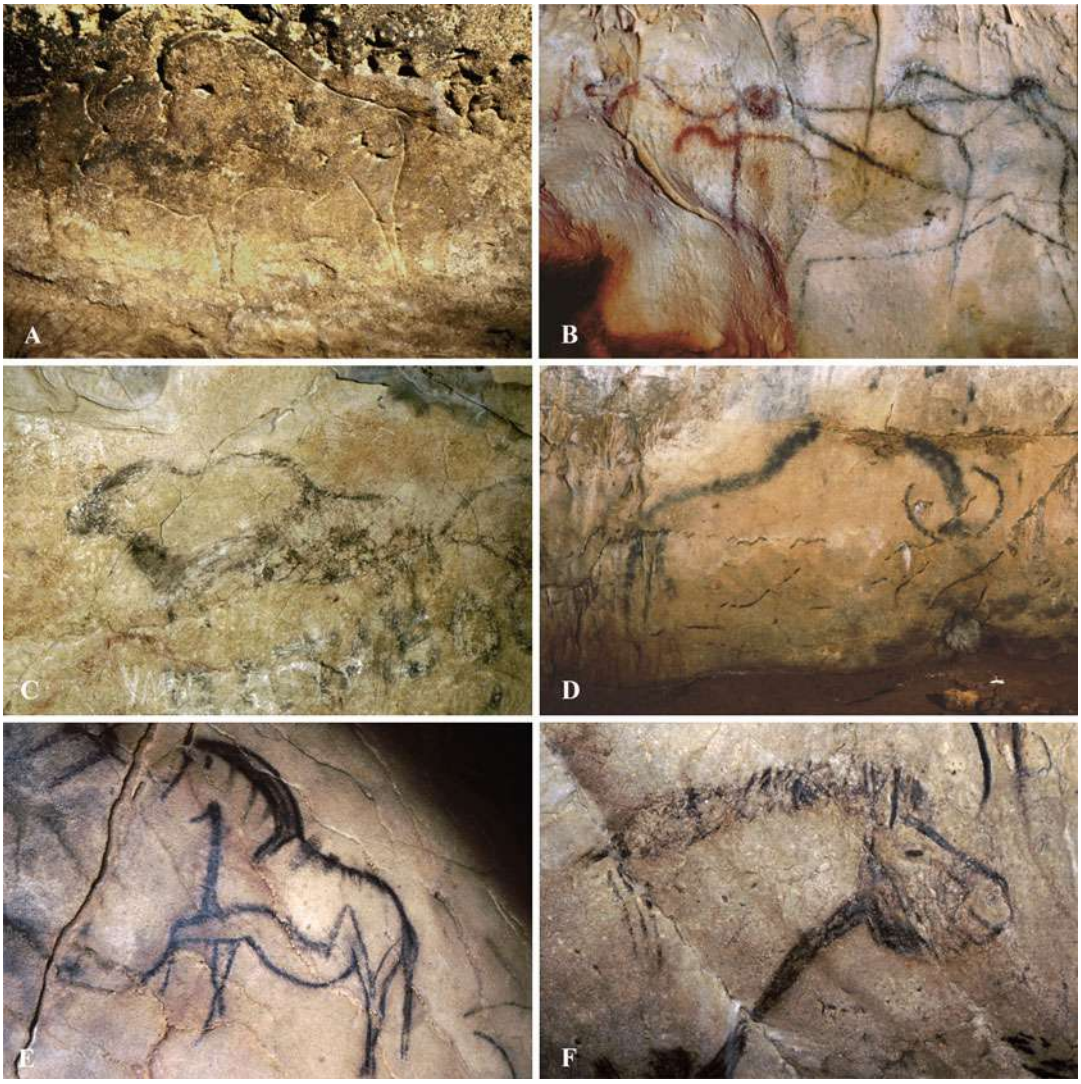
The Solutrean, the culture following the Gravettian, is very original in terms of lithic industries, but left few unmistakable traces in terms of parietal creation. The most remarkable are sculptures in bas-relief (Le Roc de Sers, Charente and Le Fourneau du Diable, Dordogne). Several caves in the Rhone valley have been attributed to this period but without certainty (Chabot, Ebbou, Oulen, Les Deux-Ouvertures).



Europe: Prehistoric Rock Art, Fig. 3 Parietal Paleolithic art in Spain, attributed to the Magdalenian. (**a**) Covaciella (Asturies). (**b**) La Garma (Cantabria). (**c**) Santimamiñe (Viscaye). (**d**) Ekain (Guipúzcoa). (Photos: J. Fortea Pérez (**a**); C. González Sainz (**b**, **c**); P. Diaz de González (**d**))

The Magdalenian, the last material culture of the Upper Paleolithic, saw a real explosion in rock art and portable art (Fig. 4e–f). In France, Lascaux is certainly the most famous Paleolithic cave because of its monumental polychrome frescos and its thousands of entangled engravings, but its belonging to the Magdalenian world is still debated (without doubt Lascaux belongs to a very early stage of the Magdalenian or even previous to this one). In the area of line drawings and paintings, authentic works of art were produced in many Magdalenian sites (Font-de-Gaume in Dordogne, Niaux in the Pyrenees). At the same time, the art of engraving reached its heights as much in Dordogne (Les Combarelles, Teyjat) as in the Pyrenees (Les Trois-Frères, Le Tuc-d'Audoubert, Fontanet). Sculpture in rockshelters also reached a remarkable level (Angles-sur-l'Anglin in Vienne, Cap-Blanc in Dordogne); it finds an equivalent no less remarkable in the Pyrenees in the form of a sculpture in the round modeled in clay (bison from Tuc-d'Audoubert, bears from Montespan). Among the original motifs from Magdalenian in its final phase, it is appropriate to signal the new type of female representations, reduced to a simplified outline with no head or extremities. This model known in several caves in Dordogne and Quercy (Pestillac, Carriot, Fronsac, Les Combarelles) saw many transpositions in portable art. These female silhouettes were also engraved on plaquettes (Lalinde in Dordogne, Gönnersdorf in Germany) and exported all over Europe in the form of figurines and pendants carved in stone, bone, antler wood, lignite, and even flint. This shows the difficulty in separating rock art from portable art for this period in prehistory.

Along with figurative motifs, the Paleolithic artists elaborated multiple conventional forms, which are called "signs." These drawings range from simple (punctuation fingerprints, large blown discs, alignment of sticks) to complex forms with evocative, but simplistic names: tectiforms (roof shaped), claviforms (club shaped), aviforms (bird shaped), etc. These signs



Europe: Prehistoric Rock Art, Fig. 4 Paleolithic parietal art in France attributed to the earliest periods (**a**–**e**) and to the Magdalenian (**e**–**f**). (**a**) La Grèze (Dordogne). (**b**) Cougnac (Lot). (**c**) Mayrière supérieure (Tarn-et-Garonne). (**d**) Marcenac (Lot). (**e**) Le Portel (Ariège). (**f**) Niaux (Ariège). (Photos: G. Sauvet)

were sometimes considered as territorial markers representative of human groups despite their vast dispersion.

The Rest of Europe

For a long time, Paleolithic rock art was circumscribed to the "French-Cantabrian" domain, and this remains the reference point today, even if caves in Andalusia like La Pileta and Ardales have been known since 1911 and 1918 respectively.

Nonetheless, a comparable art is known in the south of Italy (Romito, Romanelli) and Sicily (Addaura, Niscemi, Levanzo). Animal art in these rockshelters, most of them discovered in the 1950s, recalls by its formal characteristics the art of the final Magdalenian on the Mediterranean border, which confirms the dating of neighboring archaeological sites belonging to the final Epigravettian and the Romanellian. The Paglicci cave (Puglia) deserves a special mention, as it is probably the oldest decorated cave in Italy (apart

from Fumane in Venetia), its belonging to the Gravettian world being confirmed by the presence of negative hands.

Much more recent discoveries have considerably extended the domain of Paleolithic parietal art in Europe. This is the case for the Church Hole cave in Creswell (Derbyshire, England) in 2003. Despite some uncertainty about its iconography, it seems that there are several animal engravings of Paleolithic type, which is not surprising given that several final Paleolithic deposits, named here Creswellian, are known in this region.

In 2006, some engravings were observed for the first time in a German cave (Mäanderhöhle, Bavaria). While not figurative, their association with speleothems evoking breast or phallus brings them closer to the Paleolithic way of doing. Even more recently (2009), the site of Coliboaia in Romania was signaled. This extremely important site is similar to Chauvet in its bestiary (rhinoceros, feline, bear, bison, horse) and by its style. A recent dating confirms an age close to that of Chauvet, which is not surprising as Aurignacian settlements are abundant in Romania. It is only a matter of time before other discoveries are made in this region of Europe.

The Meaning of Paleolithic Art

At the beginning of the twentieth century, bathed as we were in ethnographic accounts, we imagined the "primitives" randomly drawing on the walls of caves the image of their game to kill them in effigy. Fortunately, the majority of specialists today recognize that rock art is the fruit of coherent and structured thought which expressed a "symbolic construction" (D. Vialou) complemented by a "figurative syntax" (A. Leroi-Gourhan). Some people think that Paleolithic thought has remained relatively constant for all its duration and others that it has been affected by a profound evolution. Without entering into this debate, we rightfully note that, despite its longevity and expansion, and despite its formal diversity, Paleolithic rock art presents undeniable structural constants which confer upon them some unity. Among these is the expert use of the irregular morphology of the walls of caves. In addition to the fact that these reliefs increase the visual salience of these works, they establish a close relationship between the underground mineral world and the animals depicted by man. This sought-after osmosis may in part explain the preference for caves. Another motif that seems a constant in Paleolithic thought is female sexual signs, which have played an important role since the Aurignacian (Chauvet, Castanet, La Ferrassie), and continues without interruption to the Magdalenian (Bédeilhac) through the Solutrean (Micolón, Spain). To this can be added the very significant tendency concerning the assemblages of distinct animal species, which persist throughout the Paleolithic.

These formal constants must correspond to ideological constants. Over time, all kinds of theories, more or less inspired by ethnology and drawn from the history of religions, followed one another, periodically resurfacing due to lack of consensus. Art for art's sake, hunting and fertility magic, totemism, and shamanism have in turn been highlighted. Given the difficulties of ethnographic comparative method and the impossibility to interpret works coming from another culture of which we know nothing, the tendency among specialists of prehistoric art is currently to divert questions of interpretation to make rock art a tool in the service of social and cultural paleoanthropology.

Post-Paleolithic Rock Art

At the end of the Paleolithic, with a change in the conditions of life, the form and function of rock art changed. It is difficult to link with certainty rock manifestations with the Mesolithic period (such is the case of geometric signs engraved in sandstone massifs in Fontainebleau, France) and to set apart local innovations from various influences coming from the east Mediterranean and the North Atlantic coast. During the Neolithic and in the zones under the influence of megalithism, a trend in schematic and geometric art developed and became the dominant form with the introduction of metallurgy (Chalcolithic, Bronze Age, Iron Age). Thousands of rock works are known in rockshelters and caves, but mostly on rocks in the open air. Only the most important sites, the most original, and the most representative ones

will be mentioned here. Their relative chronology and their reciprocal influences are very difficult to establish.

Levantine and Macroschematic Art

Levantine art is a manifestation of rock art whose center is located on the Spanish Mediterranean side (Beltrán Martínez 1968). The most significant sites are Prado de Las Olivanas, Val del Charco del Agua Amarga in Aragon, El Cogul in Catalonia, Cavalls, Civil, Remigia, La Araña in Valencia, La Sarga in Alicante, Minateda, Torcal de las Bojadillas in Albacete, and La Fuente del Sabuco in Murcia (Fig. 5). These are rockshelters exposed to daylight and rain as well as to contact with animals that used these shelters as protection, which explains why the conservation is unequal and some rockshelters are sometimes very faded and deteriorated.

The main color is red, with various hues. Black and white paint also exists, but white is only important in some regions like the Albarracín sector (Teruel). In the majority of cases, the pigments employed are iron oxides or manganese. Some examples of engravings are also known to exist.

Generally, we associate Levantine art with representations of archers, who are often illustrated in hunting scenes. However, humans appear in a wide variety of themes including representations of groups in movements, scenes of collecting honey, and executions or warlike confrontations.

In terms of style, the human figure is more useful to conduct classifications than animals. Indeed, the human figure presents marked differences allowing the definition of different graphic horizons succeeding one another in the whole domain of Levantine art. Among others these differences concern the proportions of the body; the degree of naturalism, movement, decorations; the way to represent weapons; and the type of scene in which figures are involved. In general, archers are dominant and definite representations of women are rare. The naturalism of the human representation extends from figures with legs and arms modeled with certain anatomical details, even though these are subject to marked conventions with respect to bodily proportions, to linear figures, very simplified and devoid of individuality.

Only a few animal species are represented. Basically, these are deers and wild goats and some bulls, horses, and wild boars, but these latter species are concentrated in certain regions, which allows for some regionalization to be established. Other species such as canidae, birds, or insects are in very small number.

Pictorial painting techniques used for animals range from solid infill with biangular perspective formulae for the legs and horns to parallel lines infill or simple linear contours, with the exception of the head, but this latter technique is very underused.

In some sites, notably in Sarga (Alicante), Levantine art appears superimposed to other graphic manifestations called *macroschematic* which presents a clear relationship with figurative motifs of Neolithic ceramic, thus enabling the establishment of a Neolithic chronology of Levantine art. Macroschematic art is characterized by the absence of figurative zoomorphic motifs and the predominance of human representations of a relatively large size, created with the help of wide red strokes. They frequently show lifted arms and are associated with meander-like motifs finishing with some kind of hands. The range of macroschematic art is limited to the north of the Alicante province, a major focus of the early Neolithic.

Schematic Art

The so-called schematic rock art comprises paintings under rockshelters and exceptionally in caves and engravings on rock surfaces in the open air. This art spans more than three millennia, from the early Neolithic to the Bronze Age. Its duration and geographic extension explains the large diversity in technique, style, and form (Fig. 6).

Schematic Rock Paintings Schematic rock painting is a figurative phenomenon that occupies practically all of the Iberian Peninsula and even extends to the southeast of France (Acosta 1968). The latest research suggests that these graphic manifestations have a chronocultural framework beginning in the early Neolithic (c. 6,500 BP) and finishing in the Chalcolithic (c. 4,000 BP).

Schematic rock painting essentially consists of drawings created with the help of liquid paints. The dominant colors are in descending order: red, black,

Europe: Prehistoric Rock Art, Fig. 5 Post-Paleolithic art of Levantine Spain. (**a**) Cinto de Las Letras (Valencia). (**b**, **c**, **d**) Cingle de la Mola Remigia (Valencia). (**e**) Prado de las Olivanas (Teruel). (**f**) Solana de las Covachas (Albacete). (Photos: V. Villaverde (**a**–**e**); G. Sauvet (**e**–**f**))

and white, with different hues caused by conservation issues and/or saturation of the pigments used. White is only used as a supplement to illustrate certain details. To apply paints, any instrument producing broad strokes a centimeter wide can be used (the crushed plant sprig, small wad of hair, or just a fingertip end). The loading capacity of these technical processes is very limited, making it difficult to make lines of a certain length; this determines the form and conditions the usual sizes to around 10–30 cm, the largest figures not exceeding 50 cm.

With these techniques and figurative means peculiar to schematism, highly stereotyped patterns based on simple linear features were represented: full-frontal human figures and side-on quadruped animals, that is, minimal elements of identification. Next to these anthropomorphic figures of varied typology and the animals often appear drawings resembling suns (stelliforms) in ancient phases and the so-called *oculated idols* (idols with eyes) in the later phases.

Europe: Prehistoric Rock Art, Fig. 6 Post-Paleolithic schematic art in Europe. (**a**) Los Letreros (Almeria, Spain). (**b**) Porto Badisco (Pouilles, Italy). (**c**) Campo Lameiro (Galicia, Spain). (**d**) Naquane (Valcamonica, Italy). (**e**) Domingo Garcia (Ségovia, Spain). (**f**) Tanum (Bohuslän, Sweden). (Photos: G. Sauvet (**a**–**e**); Sven Rosborn (**f**). (Figure is licensed under the Creative Commons Attribution 2.0 Generic license))

We most often find schematic paintings in the rockshelters, which easily allows daylight, or simply on unprotected vertical crags, standing out in the landscape. The lithology of mediums is very diverse: limestone and sandstone are predominant, but examples in the quartzite or granite outcrops are also known. Much more exceptional are paintings in deep caves in complete darkness like the Spanish cave of La Pileta (Malaga) or the Italian cave of Porto Badisco (Otranto) with black figures (coal in the first case or bat guano in the second). However, the specificities of these two cavities attributed to the Bronze Age mean that we must consider them as marginal in comparison to schematic paintings treated here.

Engraved Rocks from the Metal Age With the diffusion of metals, we encounter across Europe large concentrations of rocks in the open air

engraved by pecking, probably corresponding to places of cultural significance.

Mont Bego (Alpes-Maritimes, France), more than 2,000 m above sea level, was a place of pasture between 2,500 and 1,700 BCE (the Chalcolithic and Early Bronze Age). Agricultural activities are illustrated (plots, plows, schematic bovines called *corniforms (horn shaped*) and metal weapons (daggers, axes, halberds)). These very stylized and repetitive graphic representations (nearly 40,000 counted engravings) are probably related to the seasonal cycle of transhumance, through sun worship or worship of the bull (De Lumley 2011).

In Valcamonica (Lombardy, Italy), on the sides of a 70 km long valley, rock art was practiced for over 4,000 years, which explains its wide variety found in over 250,000 engravings. The earliest phase refers to the Neolithic scenes of everyday life. A second phase seems contemporary to Mont Bego with similar motifs to the exclusion of *corniforms*. The greatest number of figures belongs to the most recent periods (Late Bronze Age, Iron Age, and even Roman epoch) and consists mainly of dynamic human representations (dancing and fighting, etc.).

Another very rich zone in rock art is in Scandinavia. In the region of Tanum (west coast of Sweden), rich in megalithic relics, nearly 10,000 engravings, engraved on slabs of granite, are attributed to the Bronze Age, from the second millennium BCE. Hunting scenes, agricultural scenes, ships, and men armed with swords and spears constitute most of the iconography with signs (cups, suns, spirals). Along the Norwegian coast and close to the Arctic Circle (Alta), there are also many engravings. An early phase abundant in animals (elk, reindeer, bears, whales) is attributed to a culture of hunters, while the most recent phase is comparable to that found in Sweden and Denmark.

All along the Atlantic coast, from Ireland to the Portuguese coast, a megalithic phenomenon has developed which is largely widespread in the interior; it is, in this sense, difficult to separate it from Iberian schematic art, as shown by some motifs (axes, daggers, halberds, sun signs, snakes) that are found in both the megalithic funerary monuments, rocks in the open air, caves, and shelters.

The Atlantic coast in the Iberian Peninsula has large concentrations of engravings in the open air. More than 500 such sites are known in the region of Pontevedra (Galicia). There are granite rocks with schematic engravings attributed for the large part to an early phase in the Bronze Age. The main motifs are geometric signs (cup marks, concentric circles, spirals, zigzag) and schematic animals among which the deer plays an essential symbolic role (male cattle, bellowing males, hunted animals, etc.). Men and weapons (spears and daggers typical to the Early Bronze Age) are rare. Some swastikas and horse riders could indicate a long stretch in the Late Bronze Age.

Schematic rock carvings attributed to the Bronze Age also exist in caves in Spain (Flint Gallery, in Atapuerca, Kaite II in the karst complex of Ojo Guareña) and in France (Les Fraux, Dordogne).

Current Debates and Future Directions

Prehistoric Rock Art and the Evolution of Research

The study of rock art has long been restricted to establishing patterns of evolution of forms and styles from a cultural-historical perspective, most often based on linear trajectories taken from the History of Art (formative period, maturity, degeneration). Almost all theories responsible for explaining the place of rock art in prehistoric societies have a functionalist background, because they view art as designed to solve problems related to the functioning of society. As the processes that manage and change cultures rely on communication tools, of which graphic arts form part, their study easily came under the processual paradigm of New Archaeology in the 1950s. In the 1990s, post-processualism, born in reaction to the excesses of processualism, had the main effect of bringing archaeology and cultural anthropology together and taking into account human beings. In the field of art, the individual artist, the creator, has finally been fully acknowledged.

Conservation and World Heritage

Prehistoric rock art is an extremely fragile world heritage. Many European sites have been

classified by UNESCO as having outstanding universal values (1979, Valcamonica and decorated caves in the valley of Vézère; 1985, Altamira; 1994, Tanum; 1998, the Côa valley (and subsequently Siega Verde) and rock art in the Mediterranean basin of the Iberian Peninsula; 2008, 17 caves in the Cantabrian region). Cultural parks and the setting-up of similar replicas today enable the control of public access to their exceptional heritage, but irreversible damage has been committed by vandalism and urbanization. The conservation of the Côa valley, threatened by the construction of a dam, is a remarkable example, but cannot counter other irredeemable losses. In 1974, tens of thousands of engravings belonging principally to the Bronze Age, but some could have belonged to the Epipaleolithic, were drowned by the waters of a hydroelectric dam in Fratel in the Tagus valley (Portugal). More recently, the same drama has been repeated in the Guadiana valley (Alqueva dam) on the Spanish-Portuguese border.

Cross-References

- ▶ Altamira and Paleolithic Cave Art of Northern Spain
- ▶ Archaeology of Art: Theoretical Frameworks
- ▶ Art Studies: Normative Approaches
- ▶ Côa Valley Rock Art Sites
- ▶ Iberian Mediterranean Basin: Rock Art
- ▶ Mobiliary Art, Paleolithic
- ▶ Portable Art Recording Methods
- ▶ Rock Art Recording Methods: From Traditional to Digital
- ▶ Rock Art, Forms of
- ▶ Siega Verde Rock Art Sites
- ▶ Style: Its Role in the Archaeology of Art
- ▶ Techniques of Paleolithic Art
- ▶ Valcamonica Rock Art

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European Association of Archaeologists (EAA)

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Basic Information

The European Association of Archaeologists (EAA; http://www.e-a-a.org) is a membership-based, not-for-profit association which is open to all archaeologists and other related or interested

individuals or bodies. It is fully democratic, and is governed by an Executive Board elected by full members of the Association. A Nomination Committee ensures that the Board is representative of the different regions of Europe and the different sectors of the profession. Its membership covers most European countries, but also includes residents of all other continents interested in European Archaeology.

The EAA was established in 1994 at an Inaugural Meeting in Ljubljana, Slovenia, where its Statutes were formally approved (Cleere 1995; http://www.e-a-a.org/statutes.htm). These stipulate that the EAA was created:

- To promote the development of archaeological research and the exchange of archaeological information
- To promote the management and interpretation of the European archaeological heritage
- To promote proper ethical and scientific standards for archaeological work
- To promote the interests of professional archaeologists in Europe
- To promote cooperation with other organizations with similar aims

The EAA has held Annual Meetings since the first conference in 1994; sessions cover topics varying from the interpretation of material culture through theoretical perspectives to cultural heritage management. These conferences have been held in a range of different European cities: Santiago de Compostela, Spain (1995); Riga, Latvia (1996); Ravenna, Italy (1997); Göteborg, Sweden (1998); Bournemouth, UK (1999); Lisbon, Portugal (2000), Esslingen am Neckar, Germany (2001), Thessaloniki, Greece (2002), St. Petersburg, Russia (2003), Lyon, France (2004), Cork, Ireland (2005) Cracow, Poland (2006), Zadar, Croatia (2007), Valletta, Malta (2008), Riva del Garda, Italy (2009), The Hague, Netherlands (2010), Oslo, Norway (2011) and Helsinki, Finland (2012).

The EAA has published a journal since 1993: originally the Journal of European Archaeology 1993–1997, since 1998 the European Journal of Archaeology (EJA) (Chapman 1995; Pearce 2002). It also publishes The European Archaeologist (TEA) electronic newsletter (http://www.e-a-a.org/tea/).

Major Impact

Since 1999, the Association has awarded the annual European Archaeological Heritage Prize to an individual, institution, or to a local or regional government for an outstanding contribution to the protection and presentation of the European archaeological heritage (http://www.e-a-a.org/prizes_awards.htm). A Student Award was instituted in 2002 and is awarded annually for the best paper presented at the EAA Annual Meeting by a student or an archaeologist working on a dissertation.

The Association creates Working Parties for a limited period in order to achieve a particular result (formulate policy, develop a standard, create an inventory, etc.), while Committees are established where an issue is considered to be of permanent concern to the EAA (http://www.e-a-a.org/working_groups.htm). EAA Committees include the Committee on the Trade in Cultural Material, the Committee on the Teaching and Training of Archaeologists, and the Professional Associations in Archaeology Committee.

The Association promotes ethical professional behavior through its Code of Practice, Principles of Conduct for Contract Archaeology, and Code of Practice for Fieldwork Training (http://www.e-a-a.org/codes.htm). The EAA acts as an advisory body on all issues relating to the archaeology of Europe, and is affiliated to major institutions active in cultural heritage protection and management. In 1999, the EAA was granted consultative status with the Council of Europe, which in 2003 was upgraded to participatory status.

Cross-References

- ▶ Communicating Archaeology: Education, Ethics, and Community Outreach in North America
- ▶ Ethics in Archaeology
- ▶ Heritage and Archaeology

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European Contact and Global Expansion (Post-CE 1500): Historical Archaeology

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Introduction

The mass movement of Europeans outside their continent, beginning in the fifteenth century and the experiences of the native peoples with whom they came into contact, is one of the most important narratives of world history. Historical archaeologists have been engaged in understanding, interpreting, and explaining cross-cultural contact and interaction, especially as it pertains to the post-CE 1500 world, since their field was first formalized as a subfield within archaeology in the late 1960s. Since then, historical archaeologists' views on cultural contact have changed along with the general theoretical trends of anthropological archaeology and as greater amounts of information have been collected from across the globe.

Historical archaeologists originally tended to interpret cultural contact rather simplistically using acculturation as their guiding theory. Using this perspective, they tended to view the contact process as overwhelmingly unidirectional, meaning that indigenous peoples simply accepted foreign products and eagerly incorporated them into their ways of life. This process was observable, thought archaeologists, through the presence and abundance of foreign objects within indigenous settlements. Thus, a high percentage of European objects such as copper pots, silver bracelets, and glass beads – when compared against "traditional" objects such as stone tools and clay pottery – could be interpreted as representing a high degree of acculturation. Fewer foreign materials would imply less acculturation. With time, and using anthropological ideas as a guide, historical archaeologists began to appreciate the complexity of culture contact, realizing it to be a two-way process. In this new model, Europeans and natives learned from one another, as both were acculturated into elements of the other's culture.

The more refined understanding of cross-cultural engagement moved archaeology away from facile concepts of superiority and inferiority (where "inferior" native cultures readily accepted the "superior" products of the Europeans) and demonstrated the complex social and cultural factors that influenced the many cultural contact situations that had taken place as a result of post-CE 1500 European global expansion. An interest in the development of new cultures from a blending of two or more cultural traditions was one outcome of acknowledging the complexities of cultural contact. These new cultures – frequently termed "hybrid" or "creole" – developed around the globe as one result of culture contact. Observers can see their expressions in many places today, including throughout the Caribbean, South America, and everywhere that diverse cultures have been in contact for generations.

Since the 1990s, historical archaeologists have almost completely abandoned the acculturation model and are now conducting some of the most important and interesting research in the field of cultural contact. In the process, they are adding to the general storehouse of anthropological information concerning what happens when peoples of vastly different cultures come together and

exchange material culture. This research has developed in tandem with the general maturation of historical archaeology and has spread throughout the globe as indigenous archaeologists are adding their own perspectives about cultural contact and European expansion. Researchers investigating the cultural contacts between native peoples and Europeans have explored a huge array of complicated subjects, including the roles that gender, race, and class play, the significance of ecological variables in shaping cross-cultural encounters, and strategies of accommodation and resistance. Much of this research has become the centerpiece of study within contemporary historical archaeology because of its anthropological and historical importance to understanding post-CE 1500 global history.

Definition

The term "European contact" refers to a situation where people of European culture and heritage encounter people of non-European culture and heritage in the latter's homeland. Historical archaeologists typically reserve the term for post-CE 1500 history, but it can also be used for earlier eras as well.

Contact itself can be "direct" or "indirect." Direct contact involves a face-to-face meeting between at least two people of different heritages, backgrounds, traditions, or cultures. Indirect contact involves a minimum of three people, one of whom serves as an intermediary for the other two. Let us imagine three people in an indirect contact situation, two indigenous individuals (A and B) and a European (E). In an indirect contact situation, the European and one indigenous person will be in direct, face-to-face contact (A and E). The third individual (B) is in direct contact with the other indigenous person (A) but not with the European (E). Rather, the second indigenous person (B) is thus only in indirect contact with the European (E) through the other indigenous person (A). Indirect contact occurs between the European (E) and the indigenous person (B), even though they have never actually met face to face. The two indigenous people (A and B) can exchange European objects, ideas, or even harmful pathogens long before direct contact has occurred between the European (E) and the second native person (B).

Communities and entire cultures can equally stand in for the individuals in this simple example. And knowing this, we can easily imagine how complex and nuanced any single contact situation can be when the number of people and communities is expanded. For example, if we think about eight Europeans in contact with just 100 native people, we can see that a vast number of direct and indirect contact situations are possible. The shear number of likely contacts makes it possible to imagine the variability of circumstances that may result in real historical situations.

Some archaeologists have found the term "cultural contact" problematic for several reasons, one of which is that the concept tends to imply more interest in short-term encounters than in long-term "entanglements" (e.g., Silliman 2005). This problem is easily solved by understanding that both "short-term" and "long-term" contacts have occurred in history. A short-term contact would be represented by Martin Frobisher's meeting native people on Baffin Island in 1576, whereas a long-term contact is exemplified by the multi-year interactions between European missionaries and Maoris in nineteenth-century New Zealand. The cultural impacts of a contact situation may be small or great depending upon the precise circumstances. Frobisher may have handed out European artifacts to the Baffinland Eskimo (Nunatsiaqmiut) he met, but this encounter had little lasting impact on them. Conversely, the missionary contacts in New Zealand drastically altered traditional patterns of life as various individuals accepted the entire foreign Christian religion.

"European global expansion" refers to the historical process whereby various continental nation-states traveled far beyond their homelands in search of riches, religious converts, and new markets. The identification and exact dates of the first European encounters outside Europe remain a matter of considerable speculation, but the overall goals of European expansion were well established by CE 1500. For historical

archaeologists, one of the key factors of this process is to discover where each European colonial power built fortifications, trading posts, religious missions, industrial facilities, and settlements. These places constitute a major focal point of much research in the historical archaeology of European contact and global expansion. The history of exploration is complex, and only a brief overview can be presented here.

Historical Background

The expansion of European nation-states outside their continental homelands began long before CE 1500, as Norse, Hanse, Venetian, and Genoese traders established contacts with peoples outside Europe (Scammell 1981: 1–224). Opinions vary widely concerning the distinctions between the pre-CE 1500 and the post-CE 1500 trading networks, but historical archaeologists who accept the principles of world-systems analysis understand that the post-CE 1500 era was markedly different from what had gone before. The essential difference is that post-CE 1500 European expansions were rooted in the creation, maintenance, and expansion of a capitalist world-economy that sought to link peoples around the world into a global system of economic and political exploitation. This system funneled wealth to the capitalist cores (e.g., Lisbon, London) while creating dependencies across the globe in what came to be called the Third World (Wallerstein 2004).

Pre-CE 1500 trading networks did not have the same overarching goals as the later capitalist networks and did not include a comprehensive theory of imperialism (Abernethy 2000: 24–29). After about CE 1500, each European nation-state engaged in transoceanic exploration had the same general goals, even though the precise histories of each nation's efforts are unique. As participants in the capitalist world-economy, their basic goals were to funnel riches to the financial centers of their respective countries through extractive industries – such as gold and silver mining using the enforced labor of slaves and indentured servants – and to ship furs, spices, and other sought-after commodities to Europe. The Spanish were the first to send explorers across the Atlantic Ocean with Columbus' voyage of 1492. A protracted series of follow-up explorations took them to the coasts of both the Atlantic and the Pacific, where they established outposts throughout the Caribbean and in Mexico, Peru, and what is today the American Southwest and California (Eakin 2007: 62–87). Another colonial superpower to seek transoceanic riches was Portugal, the other great Iberian power. The Portuguese began their voyages of exploration as early as 1419, heading south rather than west. By 1500, they had visited most of the African coast, reached India, located Brazil, and traveled throughout Indonesia (Russell-Wood 1998). The Dutch, British, French, and others (such as the Swedish) soon followed on the heels of the Iberians and sought their own colonial bases of operation that they hoped would challenge the growing wealth of their Spanish and Portuguese rivals. The Dutch began their maritime trade in 1590 and soon had outposts in North and South America, the Caribbean, Indonesia, and Africa, all places that they could directly defy the economic supremacy of the other Europe powers (Boxer 1973). The French and British adopted much the same strategy in their efforts to carve out their own overseas markets, with their greatest colonial conflicts playing out in the seventeenth- and eighteenth-century wars of eastern North America (Hart 2008: 48–91).

Native peoples were continually caught in the midst of the European search for economic domination, and frequently with devastating consequences. The development of African slavery represents a glaring example because a number of the Europeans' cultural contacts were with the African peoples they enslaved as part of the burgeoning Atlantic slave trade that involved all the major European superpowers. This trade helped to shape the history of the world after CE 1500 in ways that are still being experienced today (Nimako and Willemsen 2011). Many indigenous people and communities often played the Europeans against one another in a series of clever manipulations designed to forestall their cultural destruction and physical decimation or to eliminate the European threat altogether. Trigger's

(1987: 461) account of Amantacha, the seventeenth-century Huron man who was adept at convincing both the French and the British of his good intensions, provides a poignant example of indigenous intercultural understanding.

Though similar in structure, every single contact situation experienced by indigenous peoples and Europeans throughout the world was unique. In some cases, the contact situations involved hostility and in other cases cooperation. Some involved both conflict and acquiescence as the circumstances of contact evolved. The singularity of events and processes has meant that historical archaeologists have had to adopt research strategies that are sensitive enough to identify local characteristics, yet robust enough to capture the true nature of European global expansion. It would make little sense for an archaeologist to investigate a local contact situation while ignoring the larger cultural frameworks at work, such as Eurocentrism. Similarly, it would be unwise for an archaeologist to examine the forced inequalities of Eurocentric attitudes and practices without explaining their impacts on an identifiable indigenous people. The investigation of European expansion and cultural contact allows archaeologists to study the interplay between the local and the global in interesting and enlightening ways.

Key Issues

Some of the key issues that historical archaeologists face when attempting to understand and interpret the material, social, and cultural aspects of European contact and global expansion involve creating a narrative of a particular contact situation itself. Archaeologists create these ethnohistories after carefully studying the available primary and secondary historical sources and comparing this information with the archaeological evidence. Some of their primary concerns are to understand the duration of the contact, its characteristics, the people and communities involved, and how the artifacts left behind by both indigenous peoples and Europeans can provide information that may not be available in any other source. Thus, like most historical archaeology, the archaeology of European contact and global expansion is pursued in a multidisciplinary manner, with the archaeologist drawing upon a number of diverse sources.

Archaeologists can often identify the key actors in a contact situation by the artifacts that are present at a contact-period site. Using porcelain as an example, in the fourteenth century, Marco Polo (Marsden 1818: 560) mentioned that anyone with Venetian coins could purchase porcelain cups in the Chinese city of Hangzhou. This simple reference suggests the early European interest in these exotic ceramics, and the acquisition of porcelain soon became an obsession for many Europeans. The discovery of porcelain bowls and other vessels in archaeological contexts in European cities documents some measure of contact between European traders and Chinese potters (e.g., Vermeulen et al. 2006). The discovery of shipwrecks laden with thousands of pieces of blue-and-white Chinese export porcelain indicates the strength of the continuing contacts between Europe and Asia (e.g., van der Pijl-Ketel 1982). European trade items at native sites throughout the world perform the same function of signaling that cross-cultural contact has occurred in the past (e.g., Quimby 1966).

As noted above, however, the contemporary examination of cultural contact involves much more than simply identifying the dates, duration, and characteristics of contact situations. Today's analyses are far more nuanced, as a number of historical archaeologists are engaged in unraveling the material, social, and cultural complexities of actual contact situations using archaeological research as a primary tool. Just two examples will indicate some of the complexity that is entailed in the historical archaeology of European contact and global expansion in real archaeological situations.

The area called the Flatts (also called Schuyler Flatts) was located in Colonie, New York, north of the colonial Dutch settlement of Beverwijck (later Albany). In 1643, Kiliaen van Rensselaer, the Dutch-based owner of the vast region around Beverwijck, ordered the construction of a stockaded farmhouse there. This residence/trading post was home to Arent van Curler, widely regarded as

one of the most effective Dutch diplomats in New Netherland. His primary task was to establish cordial ties with Mohawk and Mahican fur trappers in the Hudson River valley. After the British took control of New Netherland in 1664 and renamed it New York, a prominent member of the Albany aristocracy named Philip Pieterse Schuyler bought the land and constructed a new house on the site of van Curler's now-collapsed outpost. Like van Curler, Schuyler maintained friendly ties with the local Native Americans. Because the Mohawks and the Mahicans engaged in frequent hostilities, however, he, like van Curler before him, was often forced into the role of cultural mediator.

Archaeologists excavating at the Flatts between 1971 and 1974 discovered a large collection of European artifacts there, including many objects one would expect to find within any Dutch house in the Netherlands or within a Dutch colonial house in New Netherland. Familiar European artifacts included leaded window glass, fragments of drinking glasses called roemers, white clay smoking pipes, and pieces of ceramic vessels made of faience, majolica, red earthenware, and stoneware. The archaeologists also found objects useful to the local Native Americans: wampum, glass beads, glass bottles, lead shot, and gunflints (Huey 1998).

In this case, the artifacts are interpreted as objects that assisted in creating peaceful trading relations between the Europeans and the Native Americans living in the region. The reason for this interpretation rests on the reality that "with nearly constant warfare between the Dutch and native people in the lower Hudson Valley [south of the Flatts], good relations with the Mohawk were essential" (Bradley 2005: 7). Objects offered in trade – made in Europe and processed through cross-cultural transportation and social networks – thus serve as tangible markers for the social relations enacted in this particular contact situation. Elsewhere, however, the presence of similar artifacts may have a completely different meaning.

Two hundred years later and thousands of miles away in Tasmania, the Van Diemans Land Company built Burghley. Their plan was to develop a large sheep-grazing and wool-producing concern on pastureland that they judged to be of exceptional quality. The first hut at Burghley was perhaps built in 1827, but only 2 years later, the residents had constructed several wooden houses. In the end, however, the settlement was a failure, and by the late 1830s, almost everyone had abandoned it.

Relations between the Aboriginal Tasmanians and the Europeans were hostile throughout Burghley's tense history. The placement of the buildings and fences needed for the wool industry disrupted the time-honored routines of the Aboriginals, and frequent violent confrontations occurred. The Australian authorities' solution was to capture and remove the entire indigenous population from Tasmania, and in 1842, they had accomplished their goal. The one pertinent fact that stands out in this particular contact situation is that "it is clear from the historical records that Aboriginal and European people did not coexist at Burghley" (Williamson 2002: 79).

Archaeologists excavated at Burghley during two seasons in 1990s and discovered both Aboriginal and European artifacts. Many of the same kinds of artifacts found at the Flatts in New York were present at the site, including musket balls, lead shot, pieces of clay smoking pipes, and gunflints. In this particular case, however, the archaeologists interpreted the musket balls, the lead shot, and the gunflints as evidence of the violent nature of the cultural contact situation.

These extremely brief examples demonstrate at least two important points about the archaeology of European expansion and culture contact. First, every contact situation has its own history and its own narrative of intercultural association. Some situations might involve conflict and violence, whereas others exhibit collaboration and cooperation. Other contact situations might involve conflict and cooperation at different times in their histories. Although the overall plans of the various European nations were similar, their precise strategies for carrying them out could be quite distinct, often based on the actions of the indigenous peoples they encountered. No contact situation ever occurred within a cultural or historical vacuum; every instance was rooted in history and cultural tradition. Second, every historical

archaeologist examining culture contact understands that they must adopt a fully multidisciplinary approach and use whatever sources they can locate, from tiny artifacts to entire landscapes. Only in this way will they ever begin to understand both the true nature of culture contact as an overarching, post-CE 1500 process and the infinite variation in the many unique cultural encounters that have taken place throughout the world over the past 500 years.

Future Directions

The historical archaeology of European expansion and culture contact will continue to expand in the twenty-first century, and archaeologists will discover new topics to explore and new theoretical perspectives to employ. One of the most exciting areas of research involves the union of traditional knowledge with archaeological research, as historical archaeologists interact with descendant communities and begin to include traditional knowledge in their research strategies. Historical archaeologists are learning to incorporate personal interviews and ethnographic materials in their efforts to understand indigenous perspectives and insights. For example, the oral history provided by a man named M. Kennedy helped archaeologists in north-central Australia to develop a strong sense of daily life in stock-raising camps in a way that was not possible with either the archaeological or the historical information (Paterson 2008). Instead, the orally provided information was another data set that the archaeologists could combine with the other amassed evidence to provide a richer understanding of cross-cultural engagement in twentieth-century Australia.

The knowledge of post-CE 1500 European contact and global expansion will continue to grow because so much historical archaeology is now being conducted around the world. Historical archaeologists are today conducting research in regions that were left unstudied just 10 years ago. This knowledge, when amassed, evaluated, and combined, will provide important new understandings of one of the most significant processes of global history. At the same time, this concerted effort will demonstrate the importance of research in historical archaeology and the ways that historical archaeologists can contribute to knowledge on both local and global levels.

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- ▶ Atlantic Ocean: Maritime Archaeology
- ▶ Atlantic World: Historical Archaeology
- ▶ Australasian Historical Archaeology
- ▶ Brazil: Historical Archaeology
- ▶ Capitalism: Historical Archaeology
- ▶ Caribbean Historical Archaeology
- ▶ Colonial Encounters, Archaeology of
- ▶ Hispanic South America: Historical Archaeology
- ▶ Mexico: Historical Archaeology
- ▶ Mission Archaeology in North America
- ▶ Missionization and Mission Archaeology in New Zealand and Australia
- ▶ Modern World: Historical Archaeology
- ▶ North Africa: Historical Archaeology
- ▶ North America (USA): Historical Archaeology
- ▶ Pacific Ocean: Maritime Archaeology

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European Convention on the Protection of Archaeological Heritage (1992)

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Introduction

The 1992 Council of Europe Convention on the Protection of the Archaeological Heritage (Council of Europe 1992a), known as the Valletta Convention after the city in which it was signed, is a revision of the 1969 Convention with the same title (Council of Europe 1969). Following ratification by four Member States, it came into force on 25 May 1995. At the time of writing (June 2011), it has been ratified by 40 of the Member States of the Council of Europe (the States that have so far not ratified it are Austria, Iceland, Italy, Luxembourg, Montenegro, San Marino, and Spain).

The major threat to the archaeological heritage was seen in the immediate postwar period as resulting principally from clandestine excavation, and as a result, the 1969 Convention was concerned principally with the regulation of archaeological excavations and the dissemination of the results of those excavations. By the 1980s, it was recognized that a far more destructive menace had arisen as Europe entered into a period of massive development for the rehabilitation and expansion of Europe – large-scale construction projects such as motorways, high-speed trains, housing, industry, and airports, along with the loss of great expanses of land hitherto devoted to agriculture and forestry. The impact of these forces on the fragile archaeological heritage was enormous, calling for more effective protective legislation, aiming wherever possible to preserve the fragmentary evidence of Europe's past and at the same time to set up specialized archaeological teams to investigate archaeological sites and monuments before they were destroyed and to develop intensive professional survey and inventory systems. The education of the public in the value of the archaeological heritage was also identified as a major component in the recognition of the cultural identity of Europe.

Of considerable importance in the discussions that led up to the start of work on revising the 1969 Convention were a number of professional conferences and meetings during the 1980s. The most significant of these were those in Florence in 1984 (Council of Europe 1987) and in Nice in 1987 (Council of Europe 1989) on *Archaeology and Planning* and *Archaeology and Major Public Works*, respectively.

In 1988 the Council of Europe received a recommendation from its Select Committee of Experts on Archaeology and Planning, composed of professionals from all the Member States (Council of Europe 1989), that the 1969 Convention should be revised in the light both of the threats to the heritage that had developed since 1969 and of the significant new techniques for

archaeological survey and analysis, such as geophysical prospecting, satellite imagery, and laboratory analysis, that had become available. The draft Convention prepared by the Select Committee over more than 2 years' work was approved by the Committee of Ministers and opened for signature in 1992.

Key Issues/Current Debates/Future Directions/Examples

The Valletta Convention

The preamble to the 1992 European Convention on the Protection of the Archaeological Heritage (Revised) places it in the broader framework of the activities of the Council of Europe in the field of the cultural heritage that had been established by the European Cultural Convention (Council of Europe 1954). It emphasizes the problems facing the archaeological heritage, which is deemed to be "essential for a knowledge of the history of mankind." It concludes by stressing the necessity for joint action by the European States.

Article 1 begins by stating that the aim of the Convention is to protect the archaeological heritage "as a source of the European collective memory and as an instrument for historical and scientific study." Its elements are considered to be all remains and objects and other traces of mankind from past epochs, defined as including structures, constructions, groups of buildings, developed sites, movable objects, and monuments of other kinds, as well as their contexts.

In Article 2, State Party to the Convention is required to have in place a legal system for the protection of the archaeological heritage that includes the inventorization of its archaeological heritage and the designation of protected monuments and areas; the creation of archaeological reserves, even when there are no visible remains on the ground or underwater; and the mandatory reporting to the competent authorities by finders of chance discoveries of elements of the archaeological heritage.

States are required in Article 3 to apply procedures for the authorization and supervision of excavations and other archaeological activities in order to prevent illicit excavation. They should ensure that archaeological excavation and prospecting are undertaken in a scientific manner, employing nondestructive techniques wherever possible and making provision for proper preservation, conservation, and management. All excavations and other potentially destructive interventions may be carried out only by qualified and authorized personnel. Metal detectors and similar equipment may only be used after prior authorization.

Article 4 specifies that measures must be implemented for the physical protection of areas intended to become archaeological reserves, for the conservation and maintenance of the archaeological heritage (preferably in situ), and for the provision of appropriate storage facilities for archaeological materials that have been removed from their original locations.

The integrated conservation of the archaeological heritage is dealt with in Article 5, which specifies that States must seek to reconcile and combine the respective requirements of archaeology and development planning. This should entail archaeologists participating in developing planning policies designed to ensure and formulate well-balanced strategies for the protection, conservation, and enhancement of sites of archaeological interest. Archaeologists must be involved in the various stages of development schemes and systematically consult planners so as to make possible the modification of plans likely to have an adverse impact on the heritage and also to obtain the allocation of sufficient time and resources for the appropriate scientific studies to be carried out. Environmental impact assessments should be carried out so as to ensure that decisions are made that take account of archaeological sites and their settings.

The important aspect of financing archaeological research and conservation is dealt with in Article 6. States are required to arrange for public financial support to be available for this purpose from national, regional, or local authorities, in accordance with their respective competences. They are further required to increase the material resources for archaeology by ensuring that provision is made in major public or private

development schemes for covering the total costs of any necessary archaeological operations. The budgets for such schemes must provide for preliminary study and prospecting as well for eventual full publication and recording of the findings.

The Convention requires States to create or update surveys, inventories, and maps of archaeological sites and to take all practical measures to ensure the drafting, following archaeological operations, of a publishable scientific summary record before the essential comprehensive specialized studies are published (Article 7). Article 8 requires States to facilitate the national and international exchange of elements of the archaeological heritage for professional scientific purposes and to promote the pooling of information on archaeological research and excavations, as well as to contribute to the organization of international research programs.

The importance of developing public awareness of the significance of archaeological research and conservation is recognized in Article 9. States are required to conduct educational activities with a view to arousing and developing this awareness of the heritage in understanding the past and also of the threats to it. This field of activity should include promoting public access to important elements of the heritage, particularly sites, and encouraging the display to the public of suitable selections of archaeological objects.

In order to prevent the illicit circulation of elements of the archaeological heritage (Article 10), States are required to arrange for the relevant public authorities and scientific institutions to pool information on illicit excavations. They shall also undertake to inform the competent authorities in the State of origin which is a Party to the Convention of any offer suspected of coming either from illicit excavations or unlawfully taken from official excavations. Steps should be taken to ensure that museums and similar institutions whose acquisition policy is under State control do not acquire archaeological material suspected of coming from illicit excavations or unlawfully from official excavations. The attention of museums where the acquisition policy is not under State control should be drawn to the provisions of this Convention, and no effort should be spared to ensure their respect for its principles. Every effort should be made through education, information, vigilance, and cooperation to restrict the transfer of elements of the archaeological heritage obtained from uncontrolled finds, illicit excavations, or unlawfully from official excavations.

The basic legal and practical problems involved in preventing unlawful trade in elements of the cultural heritage are acknowledged to be complex and lying outside the scope of the present Convention. As a result, Article 11 States that nothing within the Convention may be taken as affecting existing or future bilateral or multilateral treaties dealing with these problems: this Convention cannot be used to interpret, minimize, or expand such treaties.

Article 12 requires States to afford mutual technical and scientific assistance through the pooling of experience and exchanges of experts in matters concerning the archaeological heritage. Furthermore, they should encourage, under the relevant national legislation or international agreements that bind them, exchanges of specialists in the preservation of the archaeological heritage, including those responsible for further training.

Explanatory Report and Commentaries

Simultaneously with the approval of the Convention in 1992, the Council of Europe issued an Explanatory Report (Council of Europe 1992b). This document puts professional flesh on the legislative bones of the Convention proper and is essential reading for archaeologists, planners, and administrators concerned with the protection of those elements of the European archaeological heritage located within the frontiers of their own countries.

The promulgation of the draft Convention and its progressive ratification by Council of Europe Member States have resulted in the publication of a considerable number of papers and articles. One of the key papers is that by a prominent member of the Council's Select Committee of Experts on Archaeology and Planning (Willems 2007). This traces the evolution of the Convention and the reactions to it by archaeologists and heritage

managers in Council of Europe Member States. Early reactions to the Convention and its implication were presented in a series of papers in *Antiquity* in 1993, covering aspects such as the legal aspects (O'Keefe 1993) and the task of achieving agreement on the often complex problems of a common nomenclature for archaeology and archaeological heritage management and conservation (Trotzig 1993). Of special interest is a review of the degree of success achieved in the interpretation and application of the Convention 10 years after it came into force by the chairman of the Select Committee of Experts on Archaeology and Planning (Trotzig 2003).

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- ▶ Cleere, Henry
- ▶ Conservation and Management of Archaeological Sites

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European Mesolithic: Geography and Culture

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State of Knowledge and Current Debates

Introduction

Holocene hunter-gatherers define the European Mesolithic. The beginning of the Mesolithic is marked by the transition from Pleistocene to Holocene, which has been dated to 11,700 cal. BP (Walker et al. 2009). The end of the Mesolithic is marked by the transition from hunting and gathering to agriculture. There is no firm date for the end of the Mesolithic because agricultural transitions occurred at different times in different regions throughout the continent. This variability, however, is not restricted to the end of the Mesolithic. From subsistence to ritual, the Mesolithic was a period of enormous diversity. The evidence for sociocultural diversity during the Mesolithic was largely due to the increasing diversity of regional landscapes caused by the amelioration of climate during the Early Holocene. The Mesolithic is a very important period for our understanding of humanity because it represents the first evidence for human occupation of the postglacial environments in Europe that have been continuously inhabited through contemporary times.

The variability of the Mesolithic archaeological record has caused a number of different subperiod designations between different regions. At a continental scale, archaeologists have

traditionally separated the Mesolithic into two subperiods (Early and Late Mesolithic) based on changes in ecology, stone tool technology, and a range of other aspects of life (Jochim 2011). This entry uses this bipartite division of the Mesolithic in Europe.

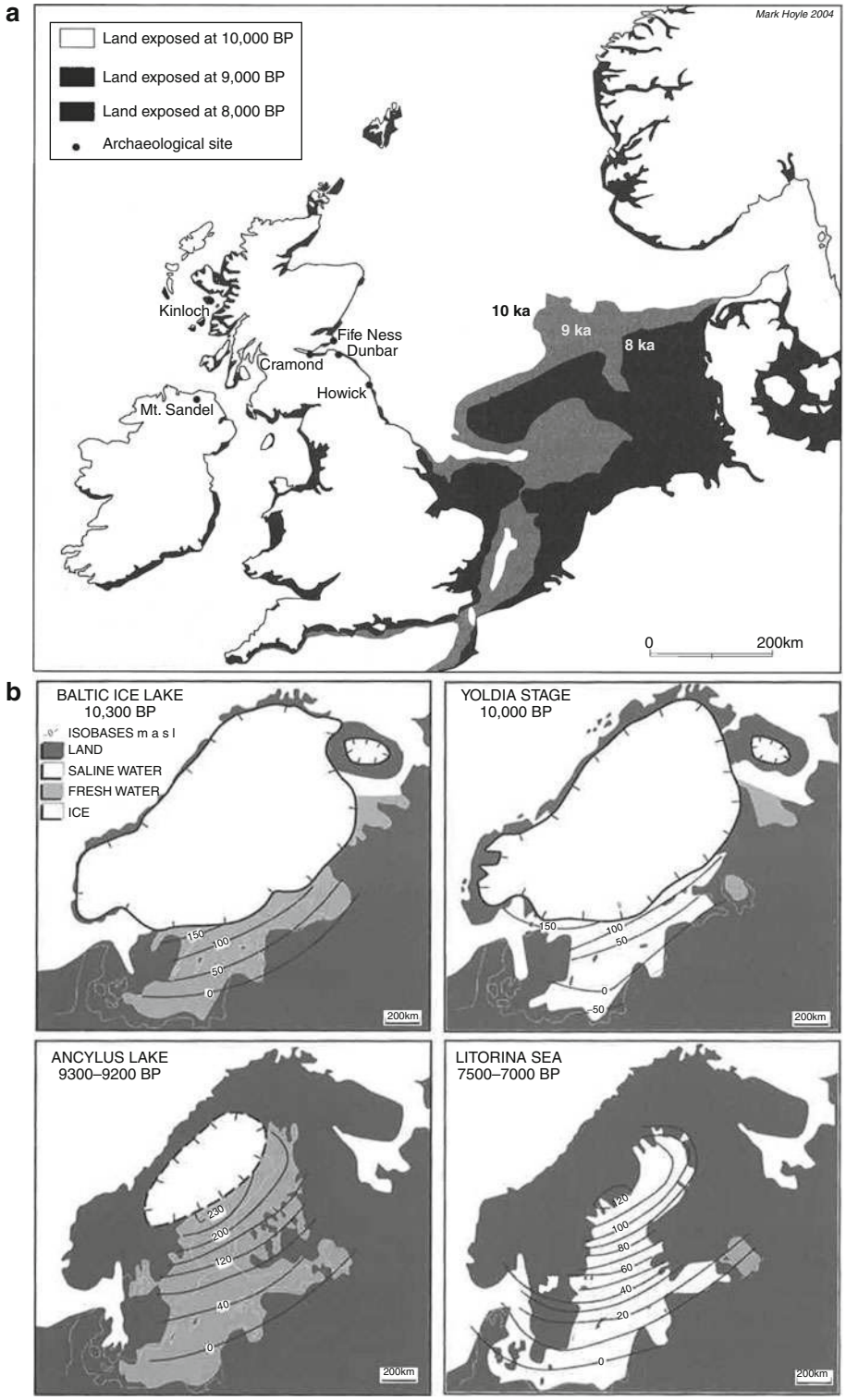
Early Mesolithic

The Early Mesolithic starts with the massive appearance of microlithic armatures made according to the microburin technique, a technique aiming at producing oblique fractures on bladelets. Although microliths already existed during the Final Paleolithic, for example, within the (Epi)Ahrensburgian culture of northern Europe (Deeben 1988) and the (Epi)Laborian culture of southern Europe (Naudinot 2008), from the early Holocene they become a standard tool all over Europe.

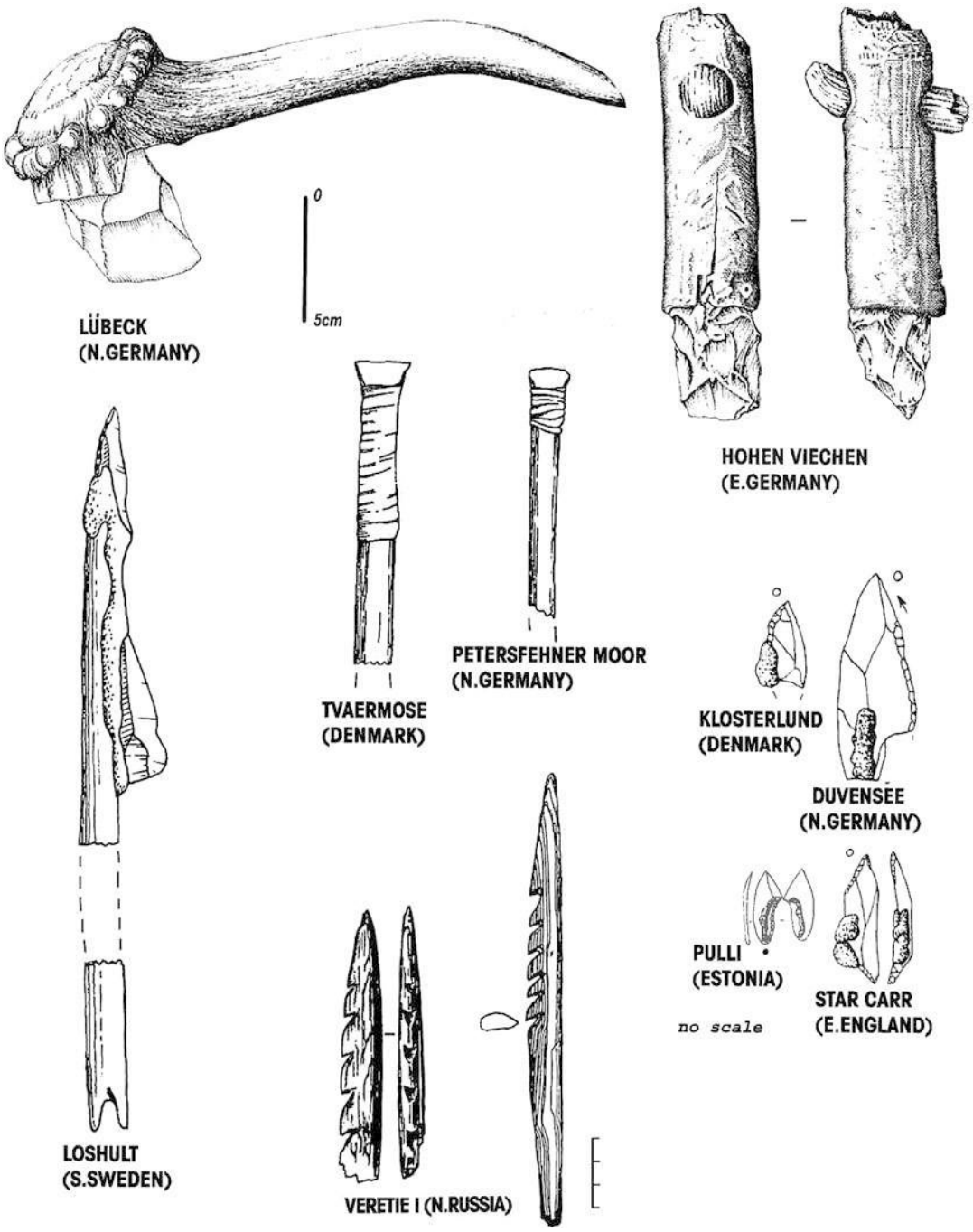
The Early Mesolithic roughly spans the Preboreal and Boreal periods, which occurred between 11,000 and 9000 cal. BP. It thus coincides with the period immediately following the last extensive glacial stadial, known as the Younger Dryas. The rapidly increasing temperature in the early Preboreal led to an acceleration in the melting of glaciers. Melting glaciers caused an abrupt rise of sea levels, with the impacts being more drastic in northern Europe, particularly in the North Sea and western Baltic Sea, than along coasts of the Mediterranean Sea (Fig. 1). The northern Adriatic Sea region, however, also experienced considerable coastline change due to rising sea levels. The inundation of former coastlines and land bridges, which continued into the Late Mesolithic, resulted in a considerable loss of lowland occupation and hunting grounds and the drowning of Early Mesolithic settlements. Many ongoing underwater survey projects using scuba diving in shallow waters and acoustic methods are starting to reveal offshore remains of Mesolithic settlements, burials, fishing installations (weirs, platforms), and implements (harpoons, hooks), albeit so far most of these seem to belong to the Late Mesolithic (Benjamin et al. 2011). The bias in the recovery of these sites thus far is likely due to Early Mesolithic sites being buried at deeper levels that have rendered them much more difficult to detect.

In northern circum-Baltic Europe (Norway, northern and central Sweden, Finland), sea-level changes were outpaced by isostatic rebound of land freed from ice. This situation therefore caused land to be uplifted and newly habitable landscapes to become available for colonization by animals and humans. Based on similarities in stone technology and raw materials, it is believed that hunter-gatherers ("Fosna-Hensbacka," "Komsa," and "Kunda" cultures) colonized these northern regions both from the south (northern Germany, Denmark) and the east (upper Volga river, NW Russia) (Rankama and Kankaanpää 2008; Bjerck 2009). The overwhelming concentration of Early Mesolithic sites along former, now elevated shorelines in southern Sweden and Norway suggests that initial colonization of these regions was organized by societies that had developed an advanced maritime technology (Bjerck 2009). Boats allowed these Early Mesolithic hunter-gatherers to settle on virgin coasts, islands, and archipelagos that were newly born out of the sea by isostatic uplift.

Despite climate during the Preboreal and Boreal being substantially more temperate compared to the preceding Younger Dryas, these periods were characterized by notable climatic instability. According to the high-resolution paleoclimate records from the Greenland ice cores, there were at least two abrupt, short-term cooling events during the Early Mesolithic that caused mean annual temperatures to drop by around 1 °C to 2 °C (Rasmussen et al. 2014). A first one, called the Preboreal oscillation (PBO), happened right at the start of the Mesolithic around 11,300 cal. BP and was characterized by a more continental climate with dry, warm summers and cold winters (Bohncke and Hoek 2007). A second cooling event is dated around 9300 cal. BP. According to recent radiocarbon evidence, this "9.3 event" had a considerable impact on Early Mesolithic hunter-gatherers, especially in the southern North Sea area, which is reflected by changes in sociocultural territory demarcation, raw material distribution, and projectile technology (Robinson et al. 2013; Crombé 2018). Even though there has been initial evidence yielded for the impacts of short-term



European Mesolithic: Geography and Culture, Fig. 1 Progressive inundation of (**a**) the North Sea basin (Bailey 2007) and (**b**) the Baltic Sea basin (Eronen et al. 2001)



European Mesolithic: Geography and Culture, Fig. 2 Composite technologies (from Kozlowski 2009)

cooling events on Mesolithic ecosystems and societies, there is much research to be done in the future that will deepen our understanding of the complexities of ecosystem and Mesolithic responses to paleoclimate change at diachronic, interregional scales of analysis.

Vegetation during the Early Mesolithic shifted from an overall open grass and shrub vegetation in

the Preboreal to a more closed birch/pine forest landscape in the Boreal. From the early Boreal onward, hazel colonized large parts of Europe and in some areas constituted a major part of the vegetation.

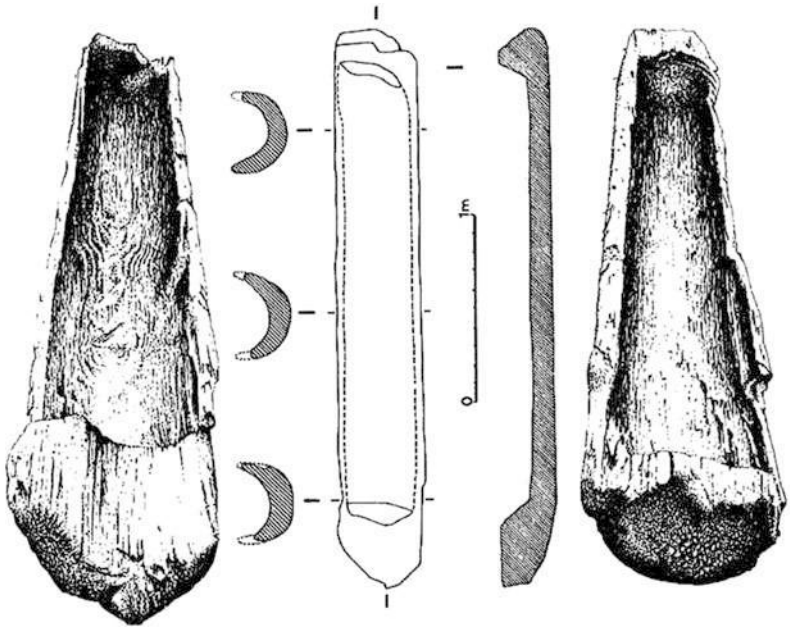
Early Mesolithic Technology

Throughout Europe, the Early Mesolithic is best documented by its lithic industries, which were mostly made on local flints. Standard tools are microliths, end scrapers, borer, and simply retouched bladelets and flakes. Burins, a typical tool of the Final Paleolithic, however, decreased in importance, albeit antler and bone working is still well represented in the Early Mesolithic. Microliths, which were mostly used as barbs and points on arrow shafts, include various types with unretouched bases, retouched bases, crescents, and triangles (Fig. 2). The ratio between these different types varies regionally; crescents, points with retouched base, and isosceles triangles, for example, are characteristic mainly for southern and central European traditions such as "Sauveterrian," "Beuronian," and "Tardenoisian," while points with unretouched bases and scalene triangles occur in large numbers within assemblages from northern European traditions such as the Maglemosian and (Epi) Ahrensburgian techno-complexes. In some regions of Europe, these broader traditions are further separated by more localized traditions. For example, within the Rhine-Meuse-Scheldt region of northwest Europe, new types of microliths characterized by flat, partially bifacial retouch appear during the last centuries of the Boreal. Also, in certain regions of northern Europe, macrolithic tools such as flake and core adzes are frequently found in Early Mesolithic contexts (Fig. 2). These tools were typically associated with various wood-working activities such as tree-felling, debarking, and likely the construction of wooden dugout canoes. Tool type designations are not the only more regionalized demarcations during the Early Mesolithic. The blades used to produce most Early Mesolithic stone tools were also knapped in different ways in different regions of Europe. For example, while blades in most regions of Europe were produced by direct percussion techniques, there appears to be a distinct change in northeastern Europe within which blades were produced by pressure knapping techniques. Pressure knapping techniques appear to be transmitted from the "Butovo culture" of the upper Volga river region of Russia to the "Kunda culture" of the eastern Baltic and finally to the Maglemosian of southern Scandinavia (Sørensen 2012). This has recently been supported by aDNA research (Günther et al. 2018), which suggests two different early postglacial migrations into Scandinavia: initially form the south, and later, from the northeast.

In wetland environments, such as peat bogs, river floodplains, and inundated coasts, excavations also revealed a wide range of tools and objects made of organic materials, such as bone, antler, and wood (Fig. 2). Interesting Early Mesolithic contexts are the sites of Star Carr (Clark 1971), Amsterdam "Europoort" (Verhart 1988), Friesack (Gramsch and Kloss 1989), Mullerup I (Brinch Petersen 1973), and Zamostje II (Lozovski 1996), among others. Perforated mattocks, barbed points or harpoons, fishhooks, and axe-sleeves were made from either antlers from red deer and elk or bone. Long bones from large mammals, mainly aurochs and red deer, were also used to make awls, adzes, needles, daggers, and hide-working tools. The techniques used to make these different organic tools have been studied in detail by David (2003). Wood served for the manufacturing of arrow shafts, bow, paddles, and also dugout canoes. The oldest canoes within Europe were found at Pesse in the Netherlands (Fig. 3).

Early Mesolithic Subsistence

The profound environmental changes that occurred at the transition from the Late Glacial to the Holocene necessitated changes in the lifeways of Early Mesolithic hunter-gatherers. The progressive reforestation and resulting installation of a temperate-boreal type of fauna caused changes in hunting strategies from an intercept-based "specie-specialized" and "group-organized" strategy during the Final Paleolithic to an encounter-based "broad-spectrum" and "small-group or individual-organized" strategy



European Mesolithic: Geography and Culture, Fig. 3 Aquatic technology. Dugout canoe from Pesse, the Netherlands (Kozlowski 2009)

during the Early Mesolithic. In most parts of Europe, large herds of migratory animals (horse, reindeer) were no longer present from the Late Glacial onward. In southern Europe, reindeer were no longer present in faunal records at the start of the Allerød, while in the hilly upland of western and central Europe, they temporarily reappeared during the Younger Dryas. Reindeer migrated further north and survived in Scandinavia well into the late Preboreal (Aaris-Sørensen et al. 2007), where they were hunted by survivors of the Tanged Point Traditions ("Fosna-Hensbacka" and "Komsa" cultures). The large reindeer herds were replaced by small- to medium-sized herds of widely dispersed and less-mobile thermophilous game. Large- to medium-sized animals (red deer, boar, roe deer, auroch, and also ibex and chamois in mountainous areas of southern and central Europe) were hunted by means of bow and arrow, while smaller species were probably trapped. Especially in the Mediterranean area (Portugal, southern France, Italy, Greece), smaller animals, such as lagomorphs, rabbits, and hare, became important meat suppliers from the Early Mesolithic onward (Bicho et al. 2000), while in northern Europe, fur-bearing animals such as beaver, otter, pine marten, and wild cat were frequently killed, mainly for their hides. Although on most Early Mesolithic sites a broad range of game is present, there are also sites that provide evidence for more specialized hunting, such as chamois, ibex, or marmot hunting sites in the Pyrenees and Alps (Barbaza 1999).

Data from across Europe also indicate that the exploitation of marine and riverine resources intensified at the transition from the Late Glacial to the Early Holocene. The first evidence of coastal exploitation has been dated to the Middle Paleolithic (e.g., at Gorham's cave in Gibraltar) but still remains scarce. Evidence of a systematic exploitation of the Atlantic shore comes from Portuguese and northern Spanish sites dated to the Late Paleolithic (c. 40,000–10,900 cal. BP) (Gutiérrez-Zugasti et al. 2011). These sites yielded accumulation of shells, however, without forming true middens. The latter first appeared during the Early Mesolithic, albeit they usually remained smaller and less dense compared to the typical Late Mesolithic shell middens (cf. below). Yet, these Early Mesolithic shell middens prove an intensification of the marine exploitation at the onset of the Holocene. Again, Early Mesolithic shell middens so far have been found only in Portugal and northern Spain, sometimes as far as 60 km away from the former coastline. The marine remains indicate the consumption of

mollusks such as limpets (*Patella vulgate* and *Patella intermedia*), top shell (*Osilinus lineatus*), mussels (*Mytilus galloprovincialis*), and common cockles (*Cerastoderma edule*); marine fish such as tope shark (*Galeorhinus galeus*) and sea bream species (*Diplodus vulgaris*, *Sparus aurata*); as well as crustaceans. Similar species have also been exploited along the Mediterranean coast of Italy and Greece (Pluciennik 2008), although not resulting in true shell middens.

Early shell middens are also absent further north along the Atlantic coast, but this certainly does not imply that marine resources were not important in northern and western Europe; their apparent absence is most likely a result of a bias due to sea-level changes, which had a much stronger impact in northern and western compared to southern Europe. However, in northern Europe, there is other evidence which supports the importance of marine resources from the start of the Mesolithic. Stable isotope analysis on skeletons from Wales (Schulting and Richards 2002) and southern Sweden (Lidén et al. 2004) gives a clear marine signal with an intake of >50% of marine resources for some individuals, clearly pointing to the existence of a specialized coastal economy already during the early stages of the Mesolithic. Furthermore, in Scandinavia, there is increasing evidence of intense and perhaps even specialized hunting of sea mammals, in particular seals, from the Early Mesolithic onward (Bjerck 2009). On the other hand, stable isotope data from skeleton remains found on the North Sea bed (van der Plicht et al. 2016) point to only minor marine consumption before and during Early Holocene sea-level rise. The diet of the last "Doggerland" occupants seemingly consisted of a combination of terrestrial and freshwater food.

The exploitation of freshwater environments has also been attested at numerous inland sites situated in major river valleys. Substantial evidence, such as large amounts of fish bones (pike, tench, bream, and eel), barbed bone projectiles, fishhooks, and fish equipment, has been reported on numerous Early Mesolithic sites especially in the Rhine and upper Danube valley (Svoboda 2008), while in other areas such as the Iron Gates in the lower Danube (Bonsall 2008) and southern Scandinavia (Boethius and Ahlström 2018), heavy reliance on freshwater fish has been deduced from isotopic evidence. In many other, mostly smaller river valleys, the evidence is less conclusive, while often (burnt) fish remains are found; their frequency is generally too low to conclude important freshwater consumption. This is also confirmed by stable isotope data from areas such as the Belgian Meuse valley (Bocherens et al. 2007) and French Charente-Maritime (Schulting et al. 2008), which indicate a strongly terrestrial diet dominated by animal protein with just a possibility of a slight contribution of marine-derived protein.

Besides aquatic and animal resources, plants (tubers, roots, mushrooms, various fruits) also became increasingly important within Mesolithic diets (Zvelebil 1994), as confirmed by numerous finds of mostly charred plant remains and vegetative plant tissue, called *parenchyma*, the latter detected by means of scanning electron microscopy (Kubiak-Martens 2016). The Early Mesolithic provides the first clear evidence for the regular gathering of plants and their central component in human diets (Jochim 2011). However, the exact contribution of plants often remains difficult to assess due to the bad preservation of plant remains. On northern European sites, carbonized shells of hazelnuts are frequently encountered in association with open fireplaces, sometimes even in large quantities. Either hazelnuts were roasted in these hearths for preservation purposes and/or destroying contaminants (Holst 2010) or they were dumped as waste in hearths after consumption (Sergant et al. 2006). According to recent estimates (Holst 2010), this high-quality, easy to store and digest resource could have covered 44% of human energy demands. In the Mediterranean region, remains of wild legumes (vetch, pea, lentil), nuts (acorn, walnut, pistachio), and seeds are frequently found (Pluciennik 2008). Besides plant macroremains, there is also indirect evidence of plant gathering during the Early Mesolithic, especially in northwestern Europe. Recent microwear analyses (Beugnier 2007) have revealed traces of plant processing on many unretouched artifacts, connected with the scraping and splitting of

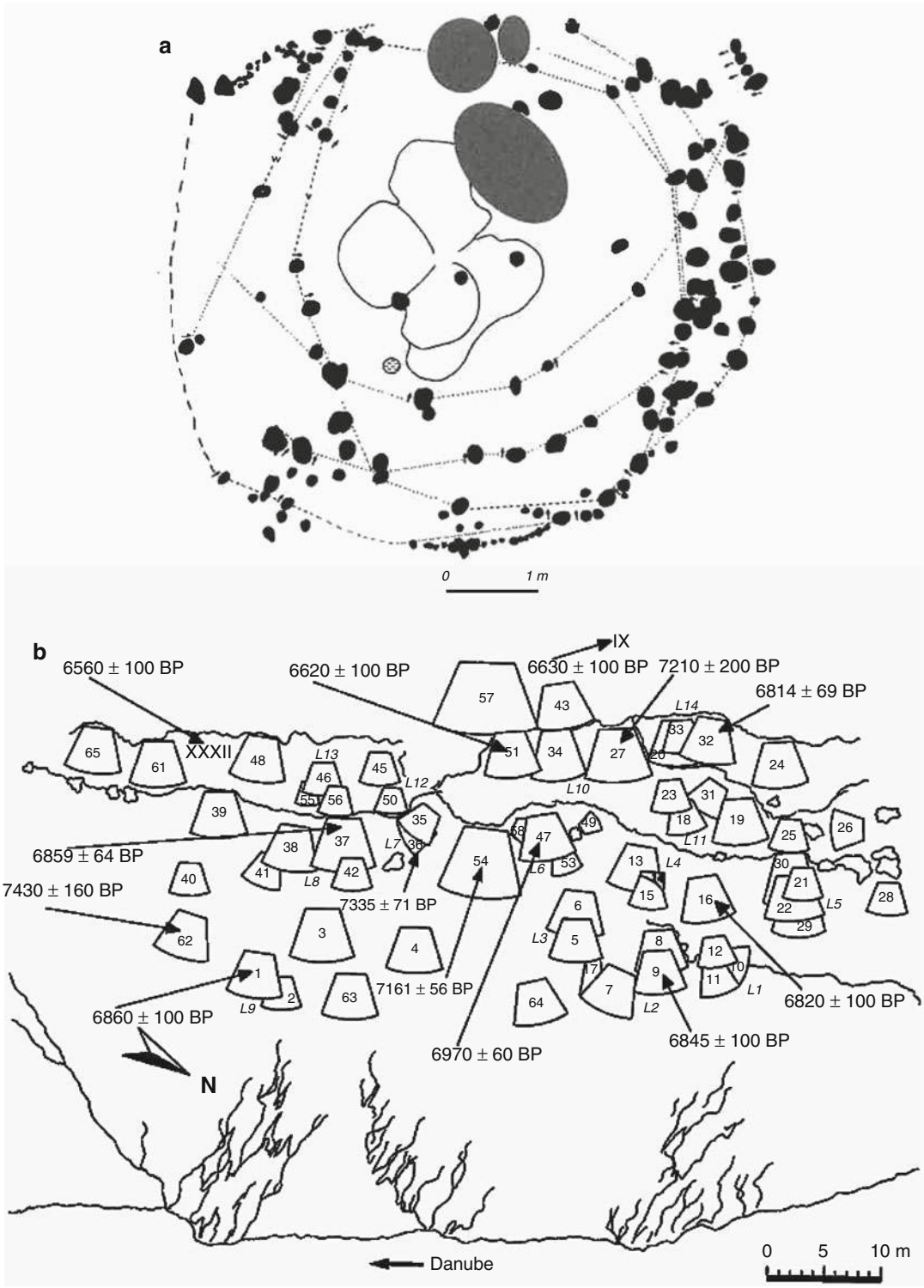
nonwoody, silica-rich soft plants such as reeds. Albeit these tools were clearly not involved in plant harvesting for consumption, they prove that from the Early Mesolithic, plants started to play a significant role in the production of fibers, for example, for making basketry and nets. Small fragments of vegetal cords and nets have been found in the bog site of Friesack (Gramsch and Kloss 1989) in NE Germany.

To summarize, Early Mesolithic subsistence varied considerably on a local and regional scale. Along the former coasts, communities mainly focused on the exploitation of marine resources, with an emphasis on mollusks and fish in southern Europe and sea mammals (seals) in northern Europe. In the interior, subsistence heavily relied on game hunting and trapping combined with plant gathering, except for the main river valleys where the consumption of freshwater resources was also very important. The frequent discovery of marine shells on inland sites, in particular used as beads in burials, possibly indicates contact and exchange between coastal and inland communities. At the French site of La Vergne (Schulting et al. 2008) c. 3300, marine shell beads, originating from the former coast 60–80 km from the site, were found in three grave structures. The near absence of marine isotopes in the skeletal material clearly proves that these individuals did not exploit nor consume marine resources at all, but just exchanged shells.

Early Mesolithic Settlement, Land Use, and Territories

The unpredictable, dispersed character of resources, in particular of wild game and edible plants, must have forced Early Mesolithic hunter-gatherers to move almost continuously through the landscape, in particular those groups that occupied the forested interior of Europe. A high residential mobility can be deduced from both the considerably larger number of sites compared to the Late Mesolithic and the generally small size of the seasonal campsites. Early Mesolithic settlements tend to cluster along open water systems, such as rivers, lakes, and fens, sometimes forming extensive site-complexes covering several hectares (Barton et al. 1995). These latter kinds of site-complexes likely represent cumulative and/or spatial palimpsests (Bailey 2007), resulting from repeated reoccupation of the same locations. Extensive radiocarbon dating of some of these palimpsests has shown that reuse sometimes spanned several centuries or even millennia, in a continuous or discontinuous way (Crombé et al. 2012). Within these Early Mesolithic settlements, lithic concentrations, probably corresponding with former dwelling spaces (Grøn 2003), are usually rather small, covering less than 20–30 m^2. The few preserved remains of Early Mesolithic superstructures, such as at Howick (Waddington 2007) or Mount Sandel (Woodman 1985) (Fig. 4), indicate that these living spaces were sometimes covered by subcircular or subrectangular tents or timber huts and had a shallow dugout floor that might have been covered with organic material. At Howick, high-resolution radiocarbon dating points to a temporary use of these dwellings over several generations up to 150–200 years. On dry-land sites with bad organic preservation, however, it remains unclear whether dwelling tents or huts have ever been present; some archaeologists believe that daily activities such as cooking, stone knapping, and hide-working were carried out in open air. At best, superstructures were erected just for sleeping in areas free of settlement waste, making them almost archaeologically invisible. In wetland environments, such as the Duvensee peatland in northern Germany (Bokelmann 1971), dwellings consist of an organic flooring made of layers of pine, birch bark, and/or bundles of twigs and branches. These "bark floors" probably formed a kind of foundation for settling in a wet and damp peat area. An exceptional wooden construction was found at the lake site of Star Carr (Clark 1971), where on this lake shore settlement, a wooden platform was made presumably to stabilize the edge of what would have been a muddy area.

Most Early Mesolithic dwelling spaces, both open air and sheltered, were provided with one or more central fireplaces which based on the often abundant presence of burnt bones and hazelnut shells served mainly for cooking and heating. On several wetland sites, sand was imported to the



European Mesolithic: Geography and Culture, Fig. 4 Dwelling structures. (**a**) Mount Sandel (Woodman 1985) and (**b**) Lepenski Vir 1 (Bonsall et al. 2000)

site in order to construct these hearths; at Duvensee, for example, considerable amounts of white sand most likely served as a heat conductor for roasting hazelnuts (Holst 2010). Based on the distribution of small flint implements (mainly microliths) combined with the presence of hearths, Grøn (2003) has attempted to reconstruct the social composition and positions of individuals within Early Mesolithic ("Maglemose culture") dwellings in southern Scandinavia. According to his analyses, repeated patterning in the spatial distribution of lithics and features leads to the identification of single and two-family dwellings, with a gradual increase of the latter toward the end of the Early Mesolithic. Judging by the small size of the dwellings, the limited (lithic) waste, and the weakly developed wear-traces on the lithic tools, it is generally assumed that most inland Early Mesolithic campsites were used for relatively short stays of small "residential" groups such as nuclear families or small microbands. Special purpose "logistical" sites, such as small hunting camps characterized mainly by a predominance of microliths within the lithic toolkit, are also regionally known, though microliths alone are not sufficient to determine such sites. Studies of microwear traces (Beugnier 2007) and/or faunal remains (Valdeyron et al. 2011) on some of these alleged hunting sites have shown that often a much wider range of activities, including domestic ones (consumption, plant processing), have been carried out. Examples of potential hunting camps can be found, for example, in the Duvensee peat area (Bokelmann 1971) and the Alpine region (Fontana 2011). In the latter region, many high mountain open-air sites and rockshelters covering areas of less than 50 m^2 have yielded evidence of specialized provisioning and exploitation of animal resources such as red deer, ibex, and chamois. These small sites were probably used during summer by small groups living in the surrounding valley in the context of vertical seasonal transhumant migration between uplands and lowlands. The recent discovery of sites with numerous pits (sometimes >100 pits), especially in northern France (Achard-Corompt et al. 2017), has led some archaeologists to suggest the existence of inland communities with a reduced mobility during the Boreal. At Auneau (Verjux 2003), for example, altogether more than 60 pits have been excavated next to a number of burials. These pits can be classified in five types: rubbish and cooking pits, cylindrical (plant?) storage structures with vertical walls, postholes with stones, and pits with intentional faunal deposits (aurochs, deer antler). These kinds of sites possibly represent so-called aggregation sites, as known from (sub)recent hunter-gatherer, where large groups met in order to exchange goods, raw materials, ideas, and mating partners, as well as for feasting and shared ritual activities. However, some pit-sites possibly should be interpreted as specialized hunting sites; based on ethnographical parallels and faunal remains, pits with a Y or V-profile might have been used as game traps.

Settlement of upland mountainous regions is also one of the most noteworthy aspects of Early Mesolithic settlement. Early Mesolithic settlements have been found as high as 2400 m above sea level in northern Italy and as high as 2200 in the Austrian and Swiss alps (Jochim 2011). Settlement of these high-altitude regions was not confined to particular kinds of sites but rather ranged from caves and rockshelters to open-air sites, often near lakes.

Contrary to the inland occupants, Early Mesolithic groups living along former coastlines and perhaps also major rivers might have known a more restricted residential mobility. The existence of shell deposits in Portuguese caves and rockshelters at a distance of 60 km from the ancient coastline suggests mobility in a relatively small strip along the coast (Gutiérrez-Zugasti et al. 2011). Similar conclusions have been drawn from raw material studies (Marchand et al. 2011) and stable isotope analyses (Schulting et al. 2008) along the west coast of France. In south Wales, stable isotopes demonstrate the existence of coastal communities which focused almost entirely on coastal resources year-round (Schulting and Richards 2002).

By analogy with recent hunter-gatherers occupying forested environments, it may be assumed that Early Mesolithic groups had to cover large territories within yearly cycles. Lithic raw

material procurement analyses (Gendel 1984; Jochim 2011) point to yearly territories of minimal 80–100 km in diameter. Similar studies also show that these local groups were part of larger cultural units, so-called dialectic tribes, which had extensive social territories. Geographical analyses of specific objects and raw materials, such as Wommersom/Tienen quartzites and flat retouched microliths in the Rhine-Meuse-Scheldt area (Gendel 1984; Robinson et al. 2013); personal ornaments, for example, pendants and beads (Newell et al. 1990); bone points and harpoons (Verhart 1988); or decorated bone and antler objects (Terberger 2006), all point to social territories covering >50,000 km^2, sometimes even attaining 230,000 km^2.

Early Mesolithic Burials and Rituals

Compared to the Late Mesolithic, Early Mesolithic burial practices are not extensively documented; however, in recent years, an increasing number of burials have been discovered. These recent discoveries have been recorded throughout the continent, from northwest Europe (Cauwe 2001; Conneller 2006) to the lower Danube (Bonsall 2008) and Dnieper (Dolukhanov 2008) basins. Early Mesolithic burials occur in both caves/rockshelters and open-air sites. The most common burial rite is inhumation. Cremation burials do begin to appear in some regions of Europe in the later parts of the Early Mesolithic (Toussaint et al. 2009; Niekus et al. 2016). Burials occur both on settlements and in separate locations.

Inhumation practices are very diverse, ranging from individual burials to multiple burials, collective burials, and secondary burials (Meiklejohn et al. 2009). In single burials, the deposition of the dead occurs mostly either stretched out on the back or in sitting position. Grave goods are generally restricted to personal ornaments (perforated animal teeth, shells), faunal remains (mainly deer antler, auroch horns), and ochre. Some graves (e.g., at the French site of Chaussée-Tirancourt), however, contain only parts of an individual and should hence be considered as secondary burials. Single graves are found either isolated (e.g., in caves) or in usually small groups of 5–10 pits.

Eastern Europe has yielded some very large communal cemeteries at sites such as Vasylievka and Volos'ke on the Danube-Dniester interfluve in Ukraine, which indicate a homogeneity of burial rites (Dolukhanov 2008). Many of these burials also yield evidence for bodies penetrated by flint arrowheads that suggest that these people died by violent encounters (Dolukhanov 2008). Combined with the evidence from northern and western Europe, it is clear that there was not a linear progression from single burials to cemeteries from the Early to Late Mesolithic but rather a complex mix of various burial rites throughout the entire Mesolithic (Meiklejohn et al. 2009).

The burial of multiple individuals within the same structure or locality also seems to be a common trait for the Early Mesolithic. In several caves, mainly in Belgium (Cauwe 2001) and the UK (Conneller 2006), and a few burial pits on open-air cemeteries (e.g., La Vergne; Schulting et al. 2008), remains of up to 11 individuals have been discovered. The famous British cave of Aveline's Hole even contained remains of 50–100 individuals, making these burial places real cemeteries which were probably reused over several generations. However, some graves at open-air sites, such as La Verge, probably need to be interpreted as real multiple graves given the fact that different individuals have been interred simultaneously. The way the deceased are treated within these "multiple and collective" burials is very diverse and complex. A common trait, however, is in the disarticulation of bones and partial internment of skeletons, leading to the conclusion that part of the treatment was done outside the burial place. In some caves (Autours, Aveline's Hole), both articulated and disarticulated skeletons have been observed. In addition, some bones display traces of cut and burning marks, pointing to excarnation. At La Verge, a burial pit even combined the remains of an inhumation and cremation grave. All this points to the existence of very complex and individualized rituals during the Early Mesolithic, at least along the Atlantic coastline.

Remains of rituals early during the Mesolithic are very scarce and often difficult to determine. Perhaps one of the clearest evidence are the finds

of stag headdresses, made out of the skulls and antlers of red deer, smoothed out inside and pierced, presumably for wearing on the head. The most important findspot of such headdresses is Star Carr, where 21 of these were found (Clark 1971). Other European sites (e.g., Bedburg) usually only yield one or two of these finds. There are various interpretations as to how they were used, including perhaps worn during stag hunts or perhaps in "ritual" ceremonies, as is known in the ethnographic record. The latter hypothesis is further strengthened, especially at Star Carr, by the high numbers of barbed points (191 specimens) made of antler splinters. According to some, Star Carr is therefore "a site where hunter-gatherer's relationship with red deer are negotiated" (Warren 2006).

In recent years, some of these Mesolithic remains have been studied on mtDNA and aDNA suggesting the existence of at least two genetically distinct Mesolithic population groups (Fu et al. 2016): a Western European (W, S, and Central Europe) and an Eastern European hunter-gatherer group (NE and E Europe). The former were most probably characterized by blue/green eyes, dark brown (possibly black) hair, and dark to black skin (Brace et al. 2019), while the latter, in particular the Mesolithic hunter-gatherers of Scandinavia, show patterns of genetic adaptation to high latitude environments, such as low pigmentation and physiological adaptation to cold (Günther et al. 2018).

Late Mesolithic

The Late Mesolithic roughly coincided with the Atlantic period, which occurred between 9000 and 6000 cal. BP. The Atlantic period witnessed the highest temperatures throughout the entire Holocene, as well as an increase in rainfall. Vegetation change was the hallmark of the Atlantic, wherein much of Europe open coniferous forests were replaced by closed, mixed deciduous forests primarily comprised of elm and oak. In mountainous regions, tree lines rose considerably. Continued increase in sea levels during this period led to the complete inundation of the North Sea basin, thus separating Britain from the continent and flooded regions of the northern Adriatic Sea. This rise in sea level promoted the development of numerous coastal estuaries that were rich in aquatic and marine resources (Jochim 2011). Another major influence on sea-level rise and aquatic and terrestrial ecology during the Atlantic period was a glacier meltwater outburst from the Laurentide Ice Shield over North America, which altered thermohaline circulation over the North Atlantic Ocean and caused an abrupt climate change event around 8200 cal. BP (Barber et al. 1999). Recent evidence suggests that this cooling event had impacts on Late Mesolithic hunter-gatherer societies. In Portugal (Bicho et al. 2010; Fernández and Jochim 2010), this climatic event and related decline in the availability of marine resources triggered a human settlement shift from the outer coast to the protected and stable inland lower Tage Valley. In northern Britain, on the other hand, some scholars (Wicks and Mithen 2014; Waddington and Wicks 2017) claim a significant and dramatic decline in the Mesolithic population as a result of the 8.2 event. During the course of this "8.2 event," another abrupt environmental change in northwest Europe was caused by the Storegga tsunami, which led to the final drowning of the Dogger Bank in the middle of the North Sea basin and was detrimental to populations settling in the coastal areas of Britain, the Netherlands, Denmark, and Norway (Weninger et al. 2008).

One of the largest challenges currently facing Mesolithic archaeologists is to understand the different impacts that these gradual and abrupt environmental changes might have had on hunter-gatherer societies across the continent (Robinson et al. 2013; Crombé 2018, 2019). There is a possibility that regional resource productivity thresholds were not passed in some regions, and therefore, Late Mesolithic populations were not impacted by these events, whereas in other regions thresholds were passed, and these events had major impacts that are reflected by changes in the archaeological record. The impact of the environment on these Early Holocene hunter-gatherer societies was undoubtedly most complex at the local and regional level (Spikins 2008), and an important area for future research will be teasing apart these various scales of complexity and their

possible influence on changes recorded in the Late Mesolithic archaeological record.

The overall increasing productivity and diversity of natural landscapes during the Atlantic period allowed for a wide range of sociocultural adaptations that are reflected in increasingly differentiated archaeological assemblages from one region to the next. The Late Mesolithic also witnessed a rise in regionally differentiated cultural groupings that were most identifiable in the preference for specific stone raw materials and microlithic armature types.

Late Mesolithic Technology

At a continental scale, one of the diagnostics of the transition to Late Mesolithic is the introduction of new stone blade knapping techniques that produced larger blades with more regular shapes in order to produce trapeze-shaped microlithic armatures (Fig. 2). The chronological variability of the transition from Early to Late Mesolithic is largely based on the different times at which regular blade and trapezoidal armatures appear throughout the continent. There is little consensus at present on whether both spread from a specific origin region or whether they entered Europe through two corridors from North Africa into the western Mediterranean (Marchand and Perrin 2017) and/or from (south) western Asia (Binder et al. 2012). Evidence indicates that these industries were accompanied by two different kind of knapping techniques. Work in the Mediterranean region indicates that they were accompanied by pressure knapping techniques (Marchand and Perrin 2017; Binder et al. 2012), whereas in areas of northwest and central Europe, they were accompanied by indirect percussion techniques (Allard 2017). The issue of the introduction of regular blades and trapeze industries to Europe is a good example of the major social organizational changes that were occurring during the Late Mesolithic period. During the Late Mesolithic period, people were becoming more settled in regional and local landscapes, and rather than ideas and technical innovations spreading by the movement of people to new landscapes, they were rather spread by social networks and a complex range of cultural transmission processes. A further example of the importance of these more regionally restricted social networks during the Late Mesolithic is yielded by the absence of regular blade and trapeze industries in Britain and Ireland.

Increasing regionalization of stone technologies is further exhibited by other innovations that were developed in a limited number of regions. This is evidenced in northern Europe, for example, by the increasing prominence of flake axes. Flake axes likely became more prominent due to a combination of their roles in dugout canoe construction and landscape clearance as populations grew. Likewise, in northwest Spain and Scotland, chipped stone picks were made that seem to support the evidence for increasing reliance on shellfish in these regions.

Other developments in stone technology are indicated by finds of perforated mace head that possibly indicate the growing role of tubers and roots in Late Mesolithic diets (Jochim 2011). Further related to changing diets during the Late Mesolithic, grinding stones and slabs have been recorded at various sites across Europe. Ground stone is also indicated by finds of ground slate points and polished axes and chisels in northern Europe.

Bone and antler technologies continue to increase in importance during the Late Mesolithic period. A new innovation in northern Europe during this time was bone points that were slotted in order to set in place various combinations of microlithic armatures. However, despite these new slotted-bone points, there are few innovations in bone and antler technologies during this period. A more prominent feature is the increasing importance of these raw materials during the Late Mesolithic. This increasing importance is evidenced by greater finds of barbed harpoons, perforated antler mattocks, and axes across Europe.

A key feature of Late Mesolithic technology is the continued development and expansion of wood and other plant technologies. In northern Europe, a complex range of fishing technologies such as nets, weirs, and traps have been recorded at sites such as Tybrind Vig (Andersen 1985) (Fig. 3). These fishing technologies were often constructed out of dogwood, alder, or birch

branches. Numerous finds of wooden hooks and net floats have also been recorded. The development of these technologies indicates the intensive fishing activities of these northern Mesolithic societies through the course of the Atlantic period.

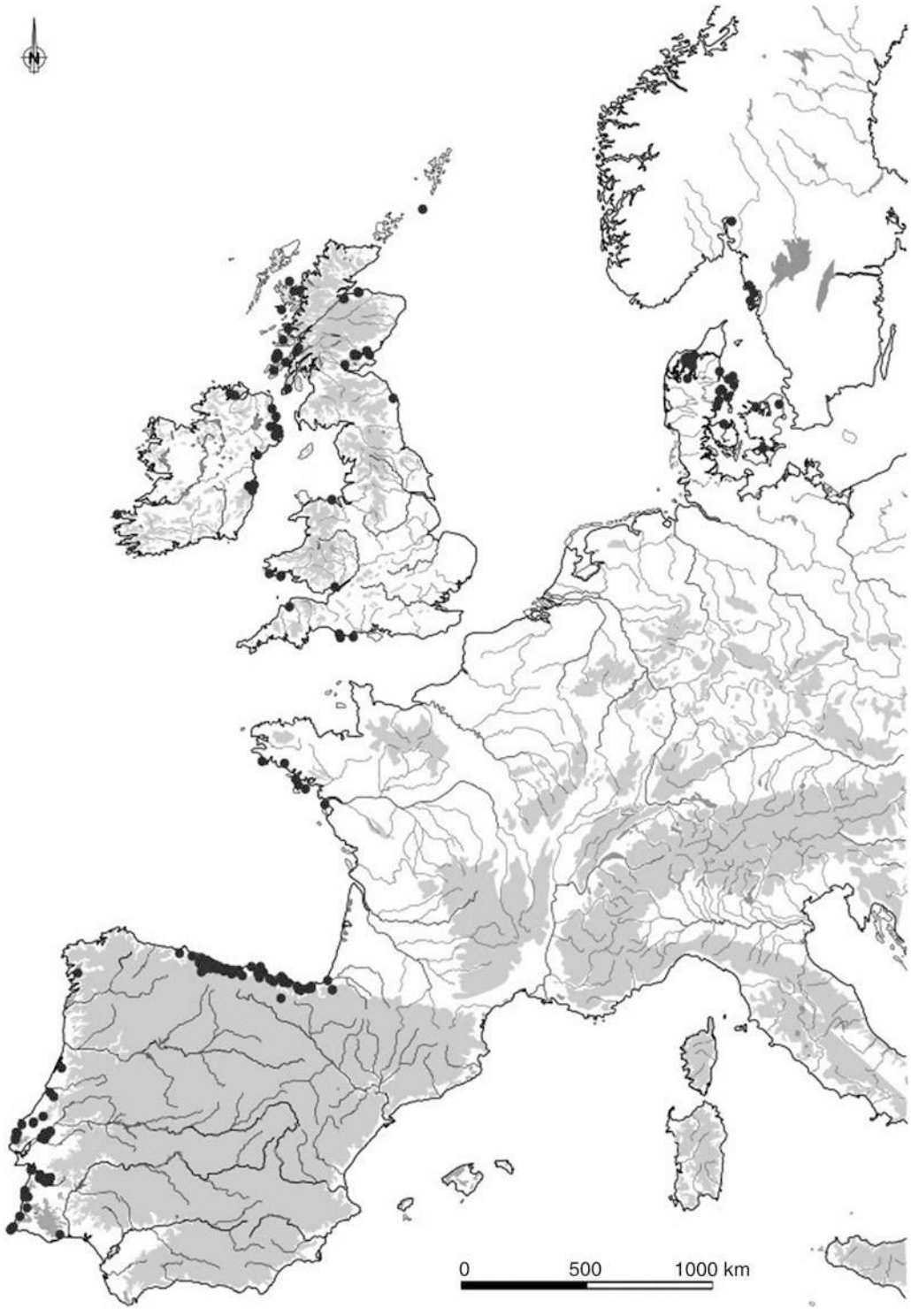
Further evidence of the increasing role of aquatic activities and exploration comes from finds of dugout canoes in northern Europe. The most impressive finds of this technology have come from the site of Tybrind Vig (Andersen 1985), where decorated paddles have been found alongside a large 9.5 m-long dugout canoe made from a linden tree.

Pottery appeared in some regions of northern and western Europe during the Late Mesolithic. There appears to be two possible sources for the spread of pottery technology to these regions. The first source is from the steppe zone between the Volga and Ural rivers in eastern Europe, wherefrom pottery technologies spread to the Baltic and North Sea basins by around 5500 cal. BCE (Dolukhanov et al. 2005). The second possible source is from neighboring Early Neolithic farming societies in the Danube, Rhine, and/or Paris basins (Crombé 2009). Each of these possible sources of pottery technology had different economies; the eastern source was hunter-gatherers, whereas the southern/southwestern source was the earliest farmers in the region. The transmission of pottery technologies to northern hunter-fisher-gatherers was therefore a variable process from one region to the next that was based on specific local social and ecological factors. Stable carbon and nitrogen isotope analyses of lipid residues on pottery from these northern Late Mesolithic sites have indicated that some pottery vessels were utilized for the processing of marine products and freshwater fish (Craig et al. 2007). Thus, while pottery technology was adopted from both hunter-gatherer and early farming societies, the adoption of this technology by northern hunter-fisher-gatherers was incorporated into ongoing subsistence systems.

Late Mesolithic Subsistence

In terms of terrestrial animal and plant species exploited, there was little change between the Early and Late Mesolithic. A key difference from the Early Mesolithic, however, is the increasing regional differentiation of Late Mesolithic diets. The most distinctive subsistence change during the Late Mesolithic was the increased dietary role of a diverse range of aquatic fauna, both freshwater and marine. Extensive shell middens develop for the first time during the Late Mesolithic and are found across the Atlantic coastline from Portugal to Scotland and across the North and western Baltic Sea basins (Fig. 5). A wide variety of shellfish species were exploited, such as clams, cockles, mussels, and oysters. Shellfish were exploited alongside a variety of marine fish such as cod, eel, mackerel, salmon, and even deepwater species such as tuna. An important change in the increase of marine components of Late Mesolithic diets in northern Europe, particularly in the Baltic Sea area, was the exploitation of marine mammals such as seals and whales. The role of aquatic resources in Late Mesolithic diets varied considerably throughout Europe. Assessment of rates of caries in human teeth found that caries rates were low in areas such as southeast (specifically, Greece and the Iron Gates area) and northern Europe due to a relatively high consumption of fish and other aquatic resources, whereas in the western Mediterranean, the higher incidence of caries provided evidence for the higher consumption of carbohydrate-rich plants alongside meat (Meiklejohn and Zvelebil 1991). Variability of the relative components of aquatic versus terrestrial resources becomes even greater when approached from local and regional perspectives.

In parts of northern and western Europe, the uptake of an entire coastal component alongside continued freshwater and terrestrial resource exploitation is one of the main features that delineates the Early from Late Mesolithic. Shellfish undoubtedly comprised an important element of Late Mesolithic subsistence, as indicated by the large size of some shell middens, but shellfish gathering represents just a part of this entire coastal component. Coastal exploitation not only enabled shellfish gathering but also the exploitation of a wide range of fish, sea mammals, and waterfowl (cranes, ducks, eagles) (Blankholm 2008). In these regions, there is evidence for



European Mesolithic: Geography and Culture, Fig. 5 Distribution map of shell middens in western Europe (Gutiérrez-Zugasti et al. 2011: 239)

smaller more specialized procurement sites both along the coasts and in inland regions. This evidence shows that there were smaller specialized sites along coastal zones for waterfowling and sea mammal hunting and in inland zones for pig hunting and pine marten trapping (Blankholm 2008). These sites indicate that during the Late Mesolithic, they were utilized in combination with larger procurement sites that were occupied over many generations, as indicated by the evidence for long-term accumulation of shell middens. Subsistence strategies were thus highly variable and in close relationship with local and regional differences in seasonal coastal and inland resource availability. A good example of the scale of local variability comes from Portuguese shell middens, which indicate differences in the shellfish species that were exploited between neighboring middens. In this region, there is evidence for the prominence of different shellfish species between different middens within the same coastal estuary, which was due to variability in local aquatic habitats (Straus 2008).

While the uptake in the coastal component of Mesolithic diets occurred earlier in the Mesolithic in southern Europe, there is evidence for an increase during the Late Mesolithic in this coastal component at some sites in the Mediterranean. This increase in a coastal component was, however, highly variable from one local context to the next. For example, at the Grotto dell'Uzzo in Sicily, there is evidence for a change in the dominance of wild boar and red deer during the Early Mesolithic to a much more diverse diet during the Late Mesolithic that added an entire coastal component of birds, fish, sea urchins, and shellfish alongside an increase in the gathering of a wide range of plant species such as olive, pea, wild strawberry, wild grape, and pulses (Pluciennik 2008). On the other hand, at the Franchthi Cave site in the Argolid of Greece, there is evidence for shellfish exploitation from the late Upper Paleolithic, and the major changes that occurred during the Late Mesolithic were the dominance of bluefin tuna bones and the increasing utilization of a broad range of plant resources (Pluciennik 2008). These contrasting sites provide good evidence for the scale of variability in the coastal component of Late Mesolithic diets in the Mediterranean.

Subsistence evidence from Lepenski Vir in the Iron Gates region of SE Europe indicates that carp and sturgeon were major components of Late Mesolithic diets at this site. Both of these species have periods of large runs up and down the river during and after spawning. Late Mesolithic hunter-gatherers likely took advantage of these seasonal fish runs, which enabled them to maintain a more sedentary lifestyle compared to hunter-gatherers in other inland regions of Europe (Radovanovic 1996). Despite this probably heavy seasonal reliance on fish, Late Mesolithic hunter-gatherers at Lepenski Vir also had very diverse diets that included large terrestrial food components. These terrestrial foods include aurochs, wild boar, domestic dog, and various bird species. The particular aquatic species that were exploited by the inhabitants of Lepenski Vir and neighboring sites of the Iron Gates region were available in abundance at a specific time, which enabled relatively intensive exploitation, but throughout the rest of the year, diets had to be sustained by a range of terrestrial species.

Further evidence of the increasing seasonal variability of Late Mesolithic diets and the relative proportions of aquatic versus terrestrial resources in diets come from wetland sites in the Rhine-Meuse-Scheldt area of the southern North Sea basin. The Hardinxveld sites (Louwe Kooijmans 2001a, b) in the Rhine-Meuse delta of the Netherlands indicate seasonal exploitation of wetlands for hunting and fishing. There is evidence from these sites for particular concentration on trapping species such as beaver and otter and fishing for pike (Verhart 2008). At these sites, wide variety of different freshwater species such as bream, carp, eel, perch, and roach were consumed alongside wild boar and red deer and waterfowl such as ducks, geese, and swans.

The diversity of Late Mesolithic diets and the evidence for specialized plant and/or animal procurement have had implications for interpretations of the transition to agriculture. Evidence for the intensive gathering of plants on some sites has led to the proposal of plant husbandry, which has been interpreted as setting the

foundations for the incorporation of domestic plants into Late Mesolithic subsistence (Zvelebil 1994). Despite growing evidence for domestic cereal pollen in pre-Neolithic contexts in a few regions of Europe, there is still too little evidence to reliably confirm this hypothesis (Price 2000). There have been proposals of local domestication of both cattle and pigs in different areas of Europe. Analyses of mitochondrial DNA have provided clear evidence for the Near Eastern origin of domestic cattle in Europe and therefore the lack of a role played by indigenous European aurochs to domestication (Edwards et al. 2007). Evidence from wild boar and pig mtDNA, on the other hand, does suggest a much more complex situation in which there were different independent domestication events in a few areas of Europe and that the appearance of domestic pigs was caused by both indigenous and introduced animals (Larson et al. 2007).

Late Mesolithic Settlement, Land Use, and Territories

As with subsistence, Late Mesolithic settlements are characterized by a higher amount of inter- and intraregional variability compared to the Early Mesolithic. The Atlantic period witnessed higher temperatures, precipitation, and dense deciduous forests that created increasingly patchy resource niches and caused a greater differentiation between inland and upland landscapes and those along coasts and rivers. Coastal and riverine sites increased considerably during the Late Mesolithic. Coastal sites have been recorded from Sweden, Denmark, Norway, Britain, France, Spain, Portugal, and Italy. While many of these coastal sites were large and had shell middens, they should not bias our understanding of the variability of coastal and inland settlements during the Late Mesolithic. For example, in southern Scandinavia inland sites of the Early Mesolithic ("Maglemose" and "Kongemose" cultures) have often been contrasted with large coastal midden sites of the Late Mesolithic ("Ertebølle" culture) in order to argue for intensive coastal settlement at the expense of inland settlement during the Late Mesolithic. This interpretation is biased due to both taphonomy and specific histories of research. Early Mesolithic coastal sites are deeply submerged and have not been recorded, and Late Mesolithic survey has been traditionally biased toward coastal areas, leaving inland settlement during the Late Mesolithic heavily underinvestigated (Blankholm 2008). Furthermore, while shell middens are a defining feature of the Late Mesolithic in these regions, the number of coastal sites without shell middens is still higher than sites with shell middens (Blankholm 2008). In recent years, the accumulation of evidence from this region has indicated that the relationship of coastal to inland settlements during the Late Mesolithic was much more complicated. For example, a model has been developed for Ertebølle settlement systems in Denmark in which larger base camps were combined with small seasonally inhabited satellite sites in the coastal surroundings (Andersen 1995). This specific model of late Mesolithic settlement has recently been extended to other areas of the western Baltic (Terberger 2006). Certain large sites with shell middens were permanent fixtures in cultural landscapes and were inhabited by a large number of family units over many generations, whereas other sites attest to more ephemeral habitation by small family units for no more than a few select seasons. Dwelling structures had variable layouts that included oval, rectangular, and trapezoidal huts/tents, some with internal platforms. Comparative analysis of Early and Late Mesolithic dwelling structures across southern Scandinavia has highlighted important changes in the internal organization of larger multiple family unit dwelling structures and continuity in the organization of smaller dwellings (Grøn 2003). Large Late Mesolithic dwellings were constructed closer to each other and had no limits on the total number of units that could be included within a single structure, which has been interpreted as an increase in the number of nuclear families that comprised a household (Grøn 2003).

The continental interior of Europe witnessed an increase in river and streamside settlements during the Late Mesolithic. This was likely due to the increasingly closed forest canopy that developed during the Atlantic period, which decreased species richness and productivity in

inland areas and increased species richness and productivity in areas beside watercourses. This situation is both good and bad for Late Mesolithic archaeology: on one hand, sites buried by alluvial sediments possess higher organic preservation potential and can yield rich material culture and subsistence data; on the other hand, sites near rivers or streams could be rendered archaeologically invisible due either to sites being buried deep beneath alluvial sediments or entirely eroded due to fluvial activity.

One of the most remarkable riverside Late Mesolithic sites is Lepenski Vir (Fig. 4), which was rescue excavated in the 1960s due to the construction of a reservoir in the Iron Gates region of the Danube River (Serbian-Romanian border). Lepenski Vir is a special Late Mesolithic site, but in the Iron Gates is just one of many Late Mesolithic sites with house structures and a variety of formal burials. This site, located on a narrow terrace sheltered in a cove along the right bank of the Danube, yielded a complex arrangement of 95 superimposed trapezoidal-shaped houses constructed over different building subphases (Radovanovic 1996). The houses faced the river and were half-buried or dug-in to the natural hollows of the terrace slope, where wooden posts were slotted in back foundation ditches to support a tentlike construction (Radovanovic 1996). House floors were plastered with a red limestone mixture, and hearths lined with limestone slabs were constructed near the fronts of the houses. Sandstone alters, sculptures of human or fishlike figures, and ornamented portable artifacts are found within houses. The different arrangements of alters and sculptures from one phase to the next indicate that changes were made in the internal spatial organization of houses through time.

The high resource productivity of coastal and riverside sites, and the corresponding suite of material culture and subsistence data found on these sites, had led to interpretations of the relatively sedentary nature of Late Mesolithic settlement in some areas of Europe. The evidence, however, possesses a high amount of local and regional variability which indicates that there are not clear one-to-one relationships between particular site types and sedentarily settled populations. A good example is provided by coastal settlement in the Mediterranean. At Franchthi Cave in Greece, there is evidence for decreasing presence on the site through the Mesolithic, and during the Late Mesolithic, there was only sporadic habitation of the site (Pluciennik 2008). On the other hand, Grotto dell'Uzzo in Sicily shows an increasing presence on the site through the course of the Mesolithic, wherein during the Late Mesolithic, there were a wide variety of marine, terrestrial animal, and plant species procured across different seasons that has led to an interpretation of lengthy seasonal occupation and possibly year-round occupation on the site (Pluciennik 2008).

On the whole, Late Mesolithic settlement can be characterized by increasing variability of settlement types, locations/concentrations, and regional site densities. There were important changes in the organization of settlement within local and regional landscapes during this period. In many areas of the continent, larger sites that were inhabited over multiple generations are surrounded by smaller more ephemerally inhabited sites. The remarkable coastal sites of southern Scandinavia or riverside sites of the Iron Gates region get the most attention, but our understanding of the realities of Late Mesolithic settlement is based on other less spectacular inland sites and smaller more ephemerally inhabited coastal or riverside sites. By placing these less spectacular sites within the context of the major coastal and riverside sites that had multiple generations of occupation, we are able to gain a more holistic understanding of the complex variability of Late Mesolithic settlement systems in different areas across the continent.

Late Mesolithic Burials and Rituals

Late Mesolithic burials were comprised of a wide variety of different burial types, including cremations, single inhumations, multiple burials, burials of dismembered heads, dog and bear burials, and cemeteries. Cemeteries and burials of dismembered heads are two remarkable characteristic of Late Mesolithic burial practice. However, as mentioned earlier in the discussion of Early Mesolithic burials, cemeteries should not be viewed as a new practice confined to the Late Mesolithic

(Meiklejohn et al. 2009). What sets these Late Mesolithic burials apart from the Early Mesolithic is their size, internal complexity and diachronic development, and spatial distribution across many regions of Europe.

Late Mesolithic cemeteries were constructed in a range of different settings. Cemeteries were built within settlements or on sites nearby settlement locations. At Lepenski Vir burials have been recorded inside houses. Burials were placed inside houses in a variety of ways, from under the house floors before the construction of the house, dug underneath already existing floors, on the floors of already abandoned houses, and the secondary placement of different body parts such as ribs and skulls throughout the houses. During the early phases of settlement, burials are orientated perpendicular to the river, but through time they are solely orientated parallel to the river (Radovanovic 1996). The change to the orientation of burials parallel to the river and the fishlike motifs of some of the sandstone sculptures indicates the major importance of the river not only for resource procurement but also for the identity or cosmology of the people who inhabited this site (Radovanovic 1996).

In some regions, such as southern Scandinavia, researchers have noted the difficulty of actually being able to demarcate settlement and burial places in the landscape, which has led to a rejection of the concept of cemetery as a formal and delimited burial ground (Blankholm 2008). Numerous burials have been recorded from shell middens across Europe, from Denmark to Portugal. On some sites, such as Skateholm in Sweden, multiple cemeteries were constructed. These cemeteries varied considerably in size. Some cemeteries contained around 10 burials, whereas others, such as Olenii Ostrov in Russia, contained an estimated 400 total burials (O'Shea and Zvelebil 1984). At cemeteries across Europe, men, women, and children are found, and there is evidence for the differentiation of individuals based on familial or clan lines, gender, and status/prestige. As in the Early Mesolithic, burials, whether they be isolated, multiple, or in cemeteries, were often sprinkled with red ochre. In terms of variability of mortuary treatment, grave goods vary significantly both within cemeteries and between different regions. In some regions, there does appear to be some patterning in the differentiation of people within cemeteries, notably along gender lines. At some sites, female graves have been recorded with goods such as jewelry, whereas male graves have been recorded with bone daggers and projectile points and stone blades and axes. On the whole, an enormous amount of variability is recorded for grave goods during the Late Mesolithic. Some of these notable goods are pendants of bone and stone, perforated animal teeth from a variety of species, carved figurines of bone, teeth or antler, and various stone and bone tool types. One of the most remarkable grave good finds in all of Europe is the famous burial at Vedbaek-Bogebakken in which a child's head was placed on the wing of a swan.

In eastern France and Germany, numerous finds have been made of Late Mesolithic burials with multiple decapitated human heads, which has led some researchers to hypothesize the presence of a "skull cult" during this period. The most remarkable of these skull finds comes from Ofnet cave in southeast Germany, where two shallow pits were found that contained multiple jawbones, skulls, and vertebrae. Around 34 or 38 skulls were found in these two pits, where they all faced west and were covered with ashes and red ochre (Jochim 2011). Analyses of the Ofnet finds have indicated that women outnumbered men and children outnumbered adults and that many of the deaths were due to blunt trauma to the head and the skulls were later defleshed and decapitated. The Ofnet finds, coupled with various other skull burials in neighboring regions and evidence of bones with projectiles imbedded in them from other regions of Europe, have led many researchers to suggest that there was a high rate of violent conflict during the Late Mesolithic (Jochim 2011).

Cross-References

► Cattle: Domestication and Development
► Clark, John Grahame Douglas

- ▶ Europe: Mesolithic-Neolithic Transition
- ▶ Lepenski Vir: Geography and Culture
- ▶ Star Carr, Archaeology Of
- ▶ Star Carr: Environmental Archaeology
- ▶ Submerged Prehistoric Landscapes
- ▶ Zvelebil, Marek

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European Middle Paleolithic: Geography and Culture

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State of Knowledge and Current Debates

Introduction

The Middle Paleolithic, in Europe, comprises an archaeological period between 250,000/300,000 and 35,000 years BP. This period corresponds to several climatic, anthropological (in a biological sense), and techno-cultural events.

From a climatic perspective, the Middle Paleolithic can be merged with the Saalian (Riss in Alpine terminology, Wolstonien in Britain) and Weichselian (Devensian and Würm, respectively) glaciations. Between the two is a brief temperate episode: the Eemian (Riss-Würm; Ipswichien). In isotopic chronology, the Middle Paleolithic generally extends from stages 10 to 3.

A human type is traditionally associated with the European Middle Paleolithic: Neanderthals. This is a typical European hominin species, even though its maximum extent reached the Middle East and the Altai Mountains in southwest Siberia.

The appearance of a new system of stone flake production, the Levallois technique, traditionally marks the beginning of the Middle Paleolithic. However, the limits with the Acheulean of the preceding Lower Paleolithic are not clear; this transition involves a slow continuum rather than an abrupt break. Some bifacial industries of the Final Acheulean are in fact contemporaneous industries with Levallois production (thus Middle Paleolithic in the strict sense). The limits are even more blurred in regions where Levallois production is absent (i.e., much of southern and eastern Europe); in the absence of human fossils, the academic tradition thus relies on dating for a Middle Paleolithic attribution.

The European Middle Paleolithic is nearly synonymous with the Mousterian, a techno-complex for which a range of different expressions are encountered across the same territory (from the Atlantic to the Ural Mountains). The Mousterian is a paradox: it is at once a period of great technological and economic stability lasting over more than 200,000 years and of great variability in its different cultural features. This variability has for years been the subject of heated debates within the Paleolithic scientific community, even creating "schools" of thought (for a history of research, see Jaubert 1999).

While the limit with the Lower Paleolithic is unclear, that between the Middle and Upper Paleolithic is by contrast much clearer. A change in the type of human (anatomically modern humans – AMH – replacing Neanderthals) is also associated to profound technological innovations (use of animal bones and antlers, different lithic techno-complexes with no continuity with the Middle Paleolithic, the appearance of highly developed nonutilitarian behaviors including parietal and portable art).

The European Middle Paleolithic is thus defined by the combination of several parameters:

A human type: Neanderthal
A main cultural system, but with many variations: the Mousterian, produced either by Neanderthals or by AMH as in the Middle East
A new technical system: the Levallois production
A temporal span: from 300,000 to 35,000 years BP

Yet a clear definition remains an instrument of comfort and covers realities that are much more complex and difficult to understand: the exploitation of territories, modes of habitat, symbolic behaviors, etc.

History of Discoveries and Evolution of Concepts

More than any other human fossil, Neanderthals have sparked intense debates and polemics; thousands of pages have been written on the subject and no doubt as much nonsense. This is because Neanderthals, more than any other human fossil, urge us to question our human uniqueness. Moreover, it is the hominin whose remains are the most abundant: around 400 Neanderthals have been discovered to date, admittedly more or less fragmentary.

The first Neanderthal was discovered in 1828 in Belgium, at Engis, by Doctor Philippe-Charles Schmerling; another was found in 1848 in Gibraltar, but neither were initially identified as such. It was in 1856 that a German anthropologist, Hermann Schaaffhausen, studied the skeletal remains entrusted to him by a naturalist, following their discovery in a cave in the Neanderthal Valley near Dusseldorf (Germany). The skull presented very strange characteristics: sloping forehead and a pronounced bulge above the eye sockets, and Schaaffhausen attributed it to a primitive man antedating the Germans. But he did not convince everyone and, although in 1864 William King proposed the denomination *Homo neanderthalensis*,

recognizing in the fossil a new hominin, many contested its status and antiquity. For some it was an idiot suffering from rickets, and for others it was a Cossack deserter from the Russian army during the Napoleonic wars. It was not until the discovery in 1886 of two skeletons in Spy (Belgium) presenting the same characteristics and accompanied by the bones of fossil animal and stone tools that ended the discussion. Scientific attitudes were probably better prepared for this discovery; the second half of the nineteenth century was a time of fantastic upheaval challenging millennia of beliefs: Darwin published *On the Origin of Species by Means of Natural Selection* in 1859 and Pasteur his discoveries against the theory of spontaneous generation in 1862, and so on.

However another, much longer, debate then began: that of the primitive nature of Neanderthals. In 1908, a Neanderthal was discovered in the cave of La-Chapelle-aux-Saints (France). Marcellin Boule, a paleontologist at the Natural Museum of Natural History, described the remains in great detail. But some errors resulting from problems of interpretation and the pathological state of the skeleton (this Neanderthal was notably suffering from arthritis and a hip deformation) led to an apelike reconstitution: curved spine and semiflexed lower limbs making it appear closer to the gorilla. This first representation would make a lasting impression in people's minds and mark our imagination, even up to the present, with the concept of Neanderthals as a thick brute, narrow minded behind a low forehead and with a hairy body: in short, an apelike being.

Antiracist movements in the 1970s caused us to consider Neanderthals much closer to us. However, it should not be forgotten that many elements still elude us: pigmentation, hair, eye color, and type of clothing, which are so far only speculation. Close to us, but despite everything still anatomically different. In the 1930s, Carleton Coon published its portrait, shaved, wearing hat, and tie, and claimed that, in a subway, nobody would pay attention to him. This statement has since been reconsidered many times. Could this hold true?

The first thing that would impress us about a dressed-up Neanderthal would be his corpulence: rather small in height, about 1 m70 for men and 1 m60 for women, and sturdy and solid, weighing, respectively, around 90 kg and 70 kg. This anatomy and muscle attachments suggest great physical strength, useful for hunting. But this size also presents another advantage: better resistance to the cold. The anatomist Carl Bergmann proposed a rule in the nineteenth century which correlated the mass of the body with the temperature of the environment: the more body mass increases, the more the relationship between body mass and the skin surface diminishes, which limits the loss of heat. Similarly, Allen's law, described in 1877 by Joël Asaph Allen, specifies that the size of bodily appendages (limbs, ears, and tail) of animals living in cold climates is smaller than that of those living in hot climates, the advantage being less heat loss. Among current populations, the proportion of the leg compared to the thigh and the forearm compared to the arm decreases from the equator toward the poles. The proportions found among the Neanderthal are even lower than among the Inuits. We would also be struck by his face, with a sloping forehead, no chin, and strong supraorbital ridges.

Biological Anthropology: Elements of Social Anthropology

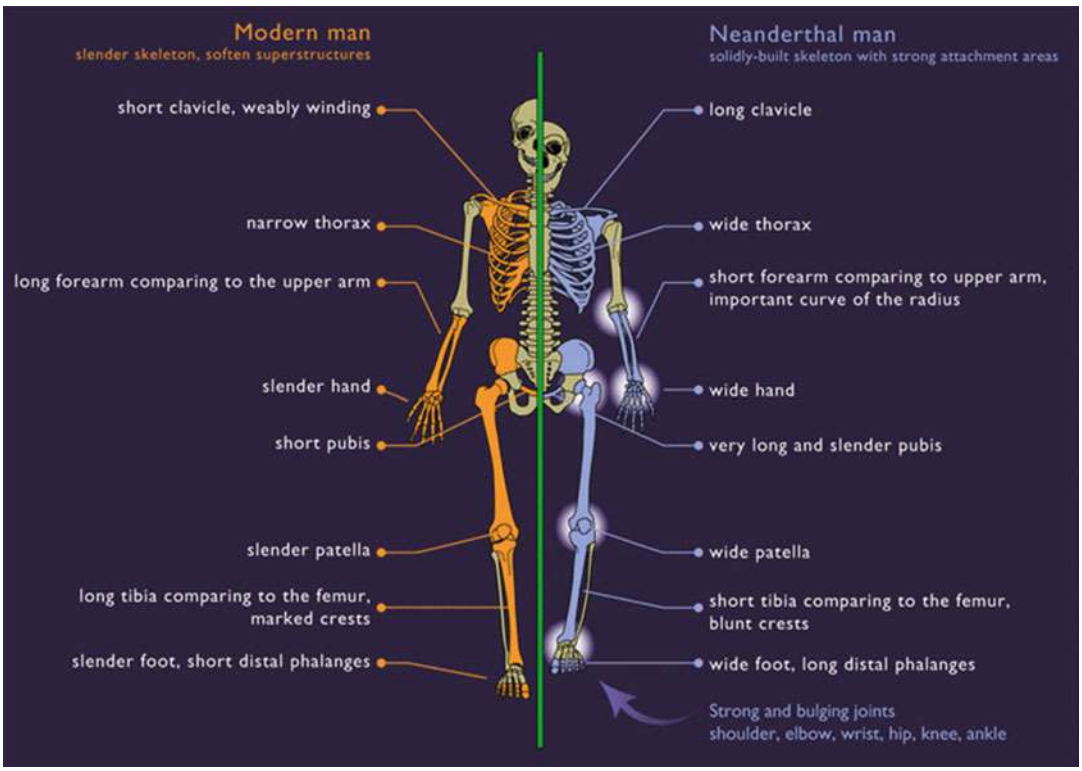
The first physical Neanderthal characteristics appeared between 500,000 and 400,000 years ago (Hublin 2008). Discrete marks can be noted on the skulls of Petralona (Greece), Sima de Los Huesos in Atapuerca (Spain), and Tautavel (France). These *Homo heidelbergensis* appear to be the ancestors of Neanderthals. This is also true for Swanscombe Man (Great Britain), dated around 400,000 BP. The first skull from Bilzingsleben (Germany, between 400,000 and 300,000 BP), by contrast, presents few Neanderthal characteristics, whereas the second one is much similar to it. As can be seen, these features do not appear simultaneously in all subjects; the difficulty is obviously to take into account changes in comparison with a successful type such as classic Neanderthals. The fossils from Biache-Saint-Vaast (France), around 200,0000 BP, are much closer to these classic Neanderthal forms.

Two factors led to the development of these genetic traits. The first is the isolation of the European peninsula during the glacial phases,

being the major part of its history during the Middle Pleistocene. During these periods the advancement of Finnoscandian glaciers and massifs of the Alps and the Caucasus, as well as the extension toward the north of the Caspian Sea, opened up only a narrow corridor between the Mediterranean and the Black Sea; the connection between Europe and the Middle East or Africa, and thus to other groups of people, was, if not impossible, at least difficult. Such geographic isolation led to genetic isolation. The second factor concerns the demographic weakness of populations. The density of Neanderthal population is estimated, depending on the calculations methods used, between 0.5 and 10 inhabitants for every 100 km ^{2}, or a total, for a territory like today's France, varying between 3,000 and 50,000 inhabitants. In these conditions, "extreme" genetic characteristics are not lost in the population and can be perpetuated.

Neanderthals are the best represented human fossil (close to 400 individuals), and physical characteristics are well known (Maureille 2007). He is robust and stocky in appearance (see above) and has strong muscle attachments (Fig. 1). He is small in size: around 1 m65; nevertheless, these characteristics fall within the range of current human variability. By contrast, some characteristics are unique to Neanderthals: brain volume is the same or higher than that of AMH, but the encephalization coefficient (ratio of brain mass and body mass) is lower; the brain of Neanderthals also shows a different organization of its lobes. The skull is long, wide, and low; the chin is absent; and the supraorbital ridges are developed. The teeth are also different, as well as the forearms and the legs, whose relationship to the arms and thighs is comparatively lower than that of AMH.

In the last several years, paleogenetic studies have contributed significant new data for the study



European Middle Paleolithic: Geography and Culture, Fig. 1 Anatomic difference between an anatomically modern human and a Neanderthal (After Depaepe 2009b; Archéosphère SARL – graphics F. Lacrampe-Cuyaubère, database B. Maureille)

of the physical characteristics of Neanderthals (for a bibliography on the subject, see http://www.eva.mpg.de/neandertal/index.html). The presence of some genes in the genetic sequence of Neanderthals gives some indications regarding their capacities and potential: for example, presence of the FOXP2 gene which is associated with voice and language in man. Conversely, mutations in modern humans genes linked to autism (CADPS2, AUTS2) and schizophrenia (NRG3) seem to be absent from Neanderthals. The increasingly advanced sequencing of nuclear DNA also shows a genetic exchange between Neanderthals and AMH. This exchange seems to have taken place in the Middle East, after AMH exited from Africa between 100,000 and 60,000 BP; the genome of current African peoples does not have this 1–4% Neanderthal origin that is found in other populations in the world. Archaeological and paleoanthropological data are consistent with this genetic data: Neanderthals and AMH shared the same culture (the Mousterian) in this region, and according to some anthropologists, the Neanderthals in these regions have physical characteristics that are less marked than in European Neanderthals, signaling the possibility of cross-breeding.

DNA analysis of a tiny bone fragment discovered in Denisova Cave (Altaï, Russia) has proved the existence of a new species of the *Homo* genus: Denisova Man, who contributed for 4–6% to the genome of current Melanesians. The Denisovans were derived from a common ancestor with the Neanderthals, from whom they are separated by around 0.6 Ma and would have populated a large part of Asia. This contribution to the genetic heritage of modern man, while modest, may, according to some researchers, prove to be important: variations in the human leukocyte antigen (HLA), whose function is to help the immune system detect faulty cells, would, for half in Europe, and nearly 70% in Asia, come from the DNA of Neanderthals or Denisovans.

Paleogenetic analyses of 12 Neanderthals from El Sidrón Cave (49,000 BP, Spain; Lalueza-Fox et al. 2011) led to the reconstitution of a familial history of this group formed of three men, three women, three adolescents (of which two were boys), and three children between 2 and 9 years of age (undetermined gender). All seem to have been killed and skinned simultaneously; the bones show signs of flesh removal. The study of lineages (using mitochondrial DNA and Y chromosomes) highlighted kinship links between members of the group: the three men are of the same lineage (brothers, uncles, or nephews), while two of the women are from different lineages, the third was from the men's line (sister or niece). Such patrilocal behavior, in which it is the women who change groups to join their spouses, is common in today's hunter-gatherer societies. The analysis also highlighted a gap of about 3 years between births, which is also frequent behavior among contemporary hunter-gatherers.

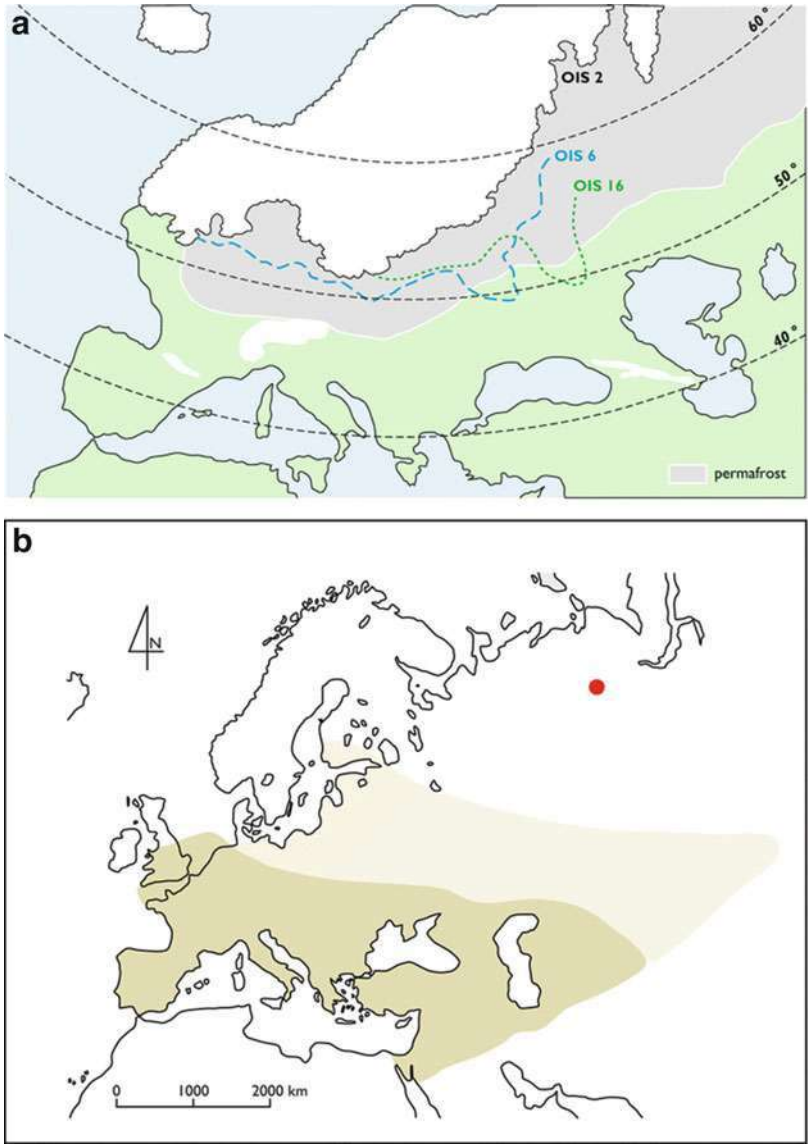
Neanderthal Ecumene

Neanderthals are above all a product of Europe (for a synthesis of the settlement of Europe during the Pleistocene, see Depaepe 2009a, 2012). But some of them also the Eurasian peninsula for other territories (Fig. 2). Thus we find Neanderthals in the Middle East around 60,000 BP (see above). Perhaps they were driven by important drops in temperature relating to isotopic stage 6 of the Saalian glaciation and stage 4 of the Weichselian glaciation. They were contemporaneous with the first AMH, present in the region since 120,000 BP. But Neanderthals also benefited from temperate phases to expand out of Europe. Recent DNA sequencing of a bone fragment discovered in Okladnikov Cave in the Altaï Mountains in south-central Siberia showed that it belonged to a Neanderthal, pushing their territory more than 2,000 km toward the east. It seems that the occupation of the vast Russian plain and Siberia and incursions was contemporary or subsequent to the last interglacial, the Eemian (c. 125,000 BP). Neanderthals are also known from Shanidar (northern Iraq) and reached the south of Finland, at Wolf Cave, undoubtedly during a warm period, perhaps the Eemian.

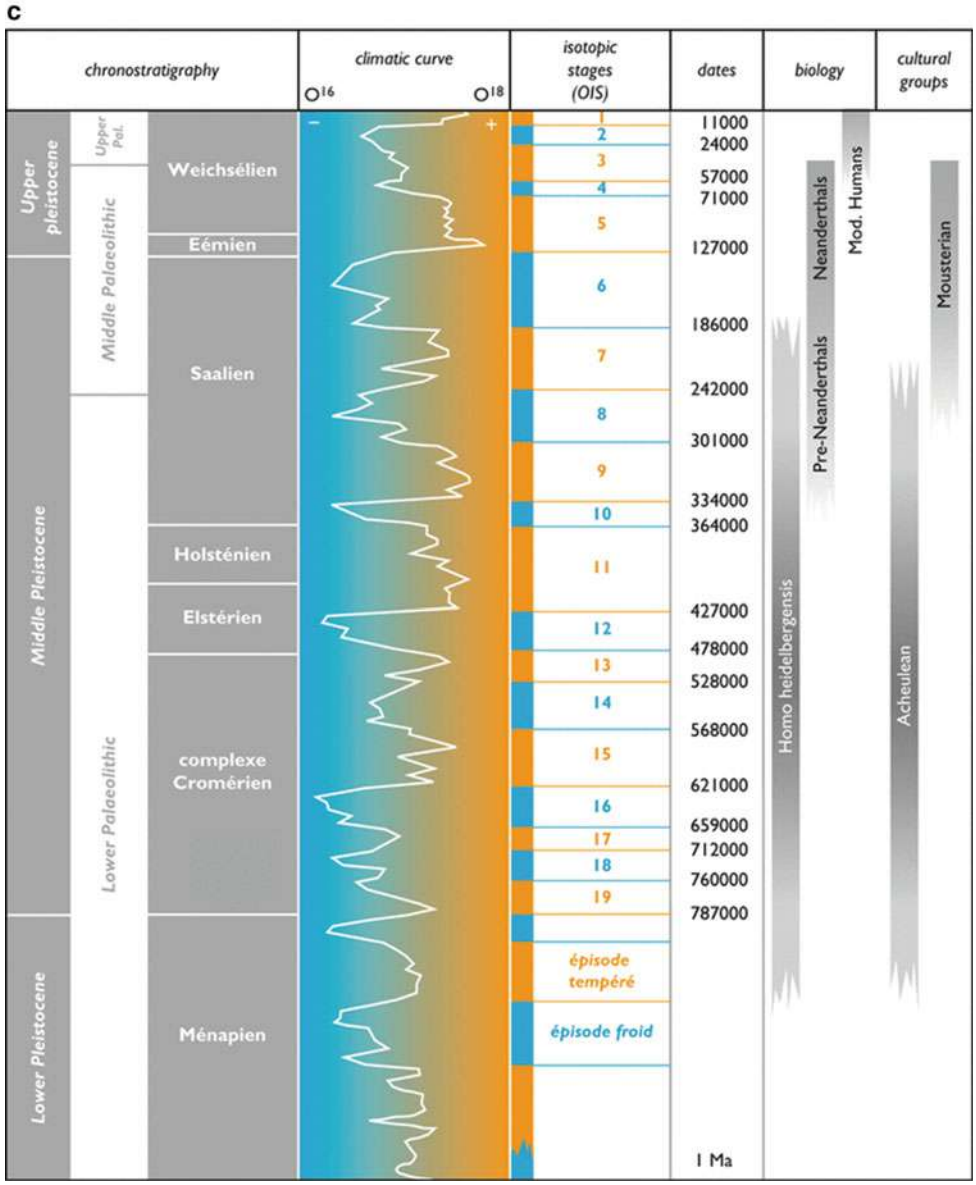
Very recently a Mousterian site was excavated in Byzovaya, in the north of Russia (Slimak et al. 2011). Located near the Arctic Circle, at 65° north latitude, this site pushes the limit of the Neanderthal habitat 1,000 km northward, if we consider

the lithic industry that has been discovered there to be their work (no human fossils were present). Moreover, the date for this site is very recent: between 29,000 and 33,000 BP, that is, after the disappearance of Neanderthals in the major part of Europe. The discoverers see there an area of refuge for the last Neanderthals who were pushed into these remote and inhospitable regions by AMH.

These vast territories were not continuously populated. According to climatic variations, immense regions were inaccessible, covered by ice or too inhospitable (cold, extreme drought, lack of game). On the other hand, during the glacial phase, lowering of the global sea level exposed thousands of square kilometers. But rare are the regions which could be continuously populated; the Périgord (France) is probably one of them which explains its nickname of the Eden of prehistory. The north of France, by contrast, is a region where settlement was very dependent on climatic conditions. Archaeological data collected



European Middle Paleolithic: Geography and Culture, Fig. 2 (continued)



European Middle Paleolithic: Geography and Culture, Fig. 2 (**a**) Extension of a glacial calotte in isotopic stage 2 (around 20,000 BP), stage 6 (around 150,000 BP), and stage 16 (around 630,000 BP); during glaciations, water trapped in the icecaps exposes vast areas covered by the sea during temperate episodes. (**b**) The Neanderthal ecumene: in plain English, the occupied territories in the Late Middle Palaeolithic and in *red*, site position in Byzovaya (Russia). (**c**) General chronology of last million years in Europe (**a**: After Hublin 2008, DAO S. Eusèbe, Inrap. **b**: DAO S. Eusèbe/P. Depaepe, Inrap. **c**: after Depaepe 2009b, DAO P. Depaepe, Inrap)

during recent years show that its occupation was important around 70,000 BP during a temperate-cold climate that favored large mammals and therefore their predators, the Neanderthals. Subsequently, a sudden cooling period (Weichselian Glacial Maximum) forced hominins to completely abandon the region and take refuge in other more welcoming places such as southwest France, unless they purely and simply disappeared locally (see below). The region would subsequently be

regained during a return to warmer conditions, but certainly by different human groups, holders of another lithic technology (Depaepe 2007). This case, which is now attested in northern France thanks to the multiplication of excavations and research, is certainly not unique, and many regions have known these comings and goings of populations.

However, it is possible that these populations did not migrate southward in search of more favorable conditions (Hublin and Roebreoks 2009). Neanderthal populations could have become locally extinct due to the reduction of animal biomass, itself reduced by the disappearance of the "mammoth steppe," a very favorable environment for the development of large mammals, the preferred prey of Neanderthal hunters. From a strictly archaeological perspective, it is indeed troubling to note that the cultural traditions seem to have suddenly disappeared, in situ, and replaced a few 1,000 years later by other traditions, therefore most probably by other human groups.

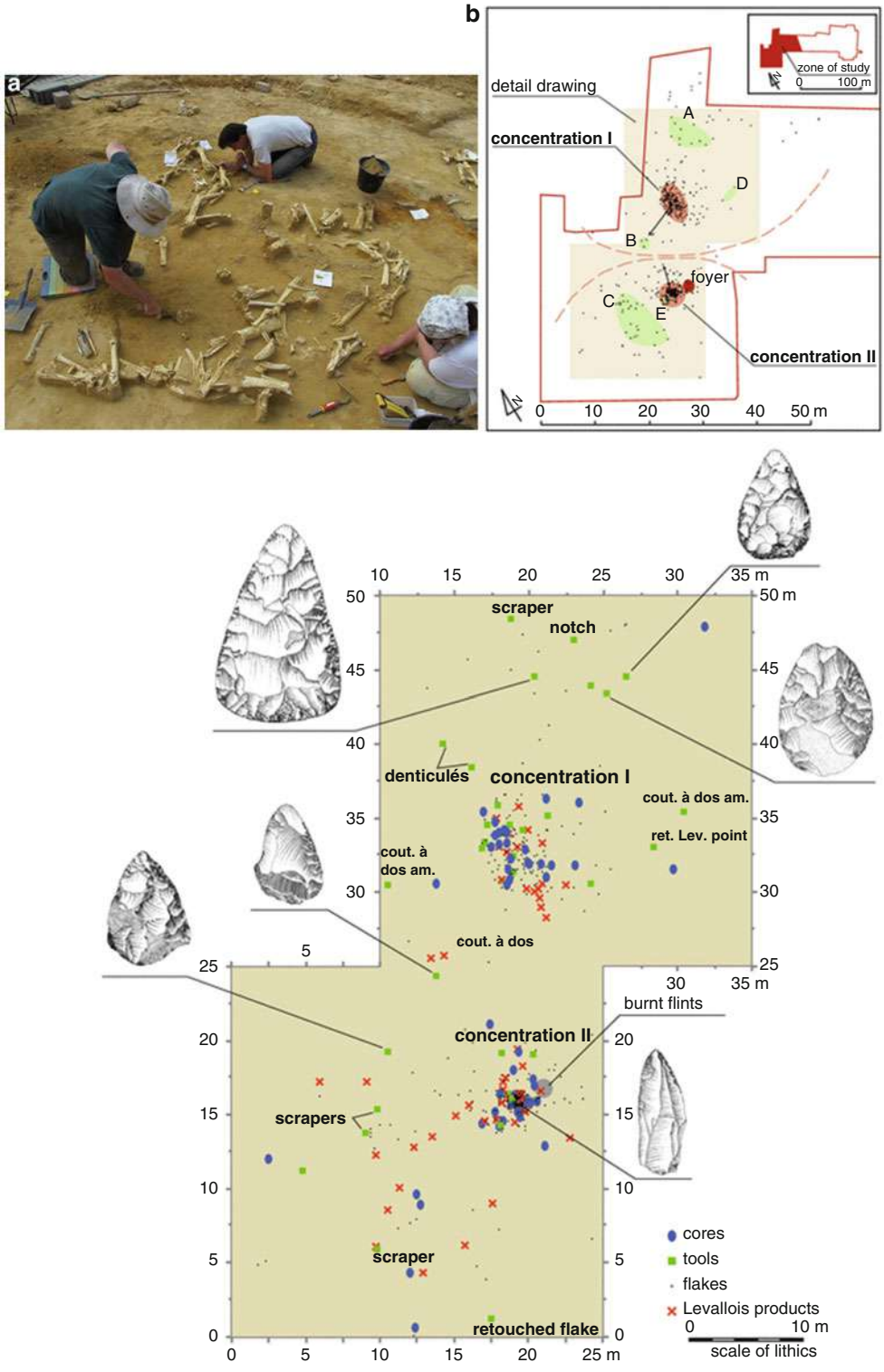
Britain is a particularly interesting case of successive occupations and abandonments of a region. Occupations are very early (Happisburgh, around 0.85 Ma at minimum; Parfitt et al. 2010). Subsequently, England was occupied until isotopic stage 7 (or the beginning of 6), with perhaps a few interruptions. The glacial maximum of the Saalian (isotopic stage 6) led to abandonment of the territory, but the sudden warming of Eemien, around 125,000 BP, creating the Channel by the sudden upwelling, formed a barrier to the expansion of Neanderthals from the continent to England, and this up until isotopic stage 4. This finding also raises questions about the inability of Neanderthals to cross the sea, and it is worth noting the absence of Neanderthal fossils in the Mediterranean islands.

Habitats and Land Use

Knowledge of Neanderthal habitats (in its broadest sense) remains limited for many reasons: firstly, taphonomic factors which, in caves just as in open-air sites, disrupt to varying degrees the organization of an occupation as it originally was when abandoned. A prehistoric Pompeii does not exist, at least not yet, and the multiple alternating freezing and thawing phases of the ground have blurred the relationships between artifacts left by men by rearranging them. These are valuable relationships that allow the archaeologist to reconstruct a site and move beyond the simple collection of material. In addition to these inherent difficulties, there is a very small amount of available data, which prevents comparisons especially when dealing with long periods of time (the Middle Paleolithic counts 10,000 generations in comparison, e.g., with the duration which separates us from the first farmers in France, less than 350 generations, or that of the Christian Era, barely 80). Finally, our own perception of things, an unconscious search that drives us to want to make comparisons according to our own modern criteria, influences interpretation. And yet, we know that we do not have exactly the same brain structure as Neanderthals, which may lead to different conceptions.

Most often cave sites deliver little information on their organization; in general, there have been many successive occupations within a confined space, each one destroying and mixing with the previous one, known as the "palimpsest" effect. In open-air sites, these problems do not occur as often. In recent years, several prehistorians have undertaken the search for open-air sites extending over large areas, up to 6,000 m^2 (it should be noted that large-scale excavation areas were undertaken in Central and Eastern Europe before Western Europe). The results are quite surprising. Artifact densities are highly variable, ranging from less than one piece per square meter to several dozen, but rarely uniform; high concentration areas can be adjacent to areas with almost no artifacts. These zones reflect different activities: knapping, butchery, etc. (Fig. 3). At the site of Lailly (France, c. 65,000 BP; Depaepe 2007), two flintknapping clusters have been found next to each other, the first showing confident mastery of knapping, the other some inexperience, which perhaps reveals apprenticeship by imitation.

The sizes of these sites are also quite variable, reflecting different types of occupations as well as perhaps environmental constraints; the installations could be in fact potentially different



European Middle Paleolithic: Geography and Culture, Fig. 3 (continued)

depending on whether one finds oneself in a clearing or an open plain. Data provided by the study of faunal remains on sites show that these occupations were certainly seasonal. But their actual duration is often a question for archaeologists: while it is clear that some of them were very short, such as a butchery site after a hunt, for other occupations it is difficult, or even impossible, to estimate, especially as we also do not know the number of occupants; an extended family and a group of 50 people do not produce the same amount of artifacts. And yet it is often difficult to determine the function or functions of the site.

Preventative archaeological operations have demonstrated the phenomenon of successive occupations at a number of open-air sites (Depaepe 2007). In contrast to caves which are clearly welcoming structures, no topographic constraints exist for open-air sites. When occupations spread out over long periods, with intervals of many millennia between them, we can assume that the area was of particular interest, bringing people back to the same place and that its attractions were perennial: waterhole, flint sources, etc. It may also be possible that it is only due to chance that people become established in the same place as others did 10,000 years before them. But at some open-air sites, we find successions of occupations most certainly quite close in time: within a year, maybe less. The similarities between these occupations suggest that it is the same group of people who periodically returned to this place, probably as part of a pattern of land use.

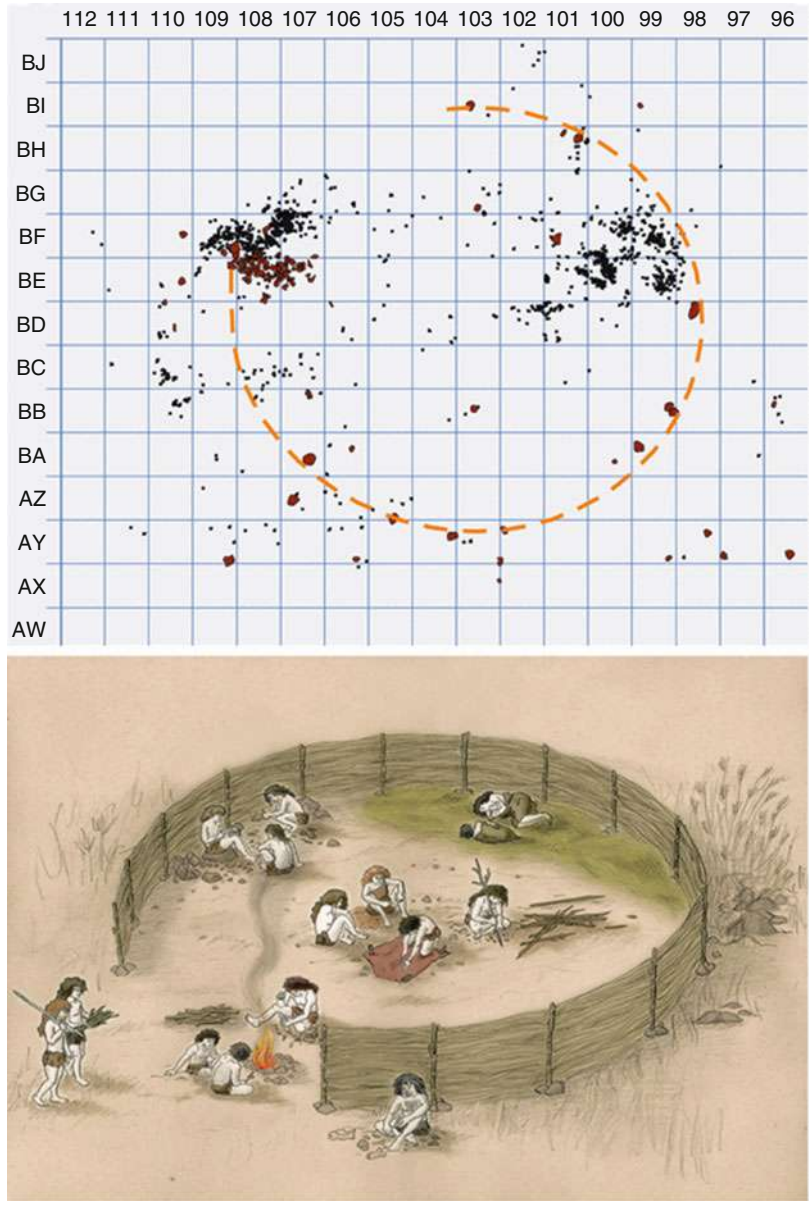
While we can assume that the hearth would have been a structuring element of a habitat, particularly in cold, even periglacial climates, the traces that remain are tenuous. In cave sites, hearths are sometimes discovered, in the form of a few blocks arranged in a circle to delineate the heating area. Outdoors, hearths are extremely rare, while elements which were heated, such as bones and flint, are more frequent. One is tempted to believe that the homes were only rudimentary and that the covering of sites led to their destruction. It is also possible that for some occupations of short duration, men were not bothered to make fire. Curiously, the traces of hearths outdoors are more frequent in Central and Eastern Europe than in Western Europe.

Evidence of organization of the living space is even rarer than for hearths: for the whole of France, we count only a few post holes at Combe-Grenal rockshelter, several hollows devoid of all archaeological material, which could perhaps have been used for storing meat, at La Quina rockshelter, Le Moustier, or even La Ferrassie. In Poitiers (France), a recent excavation revealed what could have been a windbreak (Bourguignon et al. 2003, Fig. 4). Internal structuring may also be perceived: sleeping areas, knapping areas, etc.

By contrast, in Central and Eastern Europe, traces of domestic organization are more abundant. Large pits have been found in Rheindahlen (Germany), with traces of hearths, knapping areas, and stone blocks arranged in a ring (rigging walls?). Structured habitats are also evident at Ripiceni-Izvor (Romania): groups of pits with hearths and lithic artifacts; stone blocks and mammoth tusks perhaps contributed to the construction of superstructures. This site may have been a place dedicated to seasonal mammoth hunting (Paunescu 1993), like the one at Molodova (Ukraine). However, for some researchers, these structures would be either natural or wrongly dated and actually much more recent (15,000 BP like the most of these types of sites in Eastern Europe).

At Abric Romani (Spain), combustion areas within the J level form real domestic zones around

European Middle Paleolithic: Geography and Culture, Fig. 3 (**a**) Tourville-la-Rivière site (France), view of fauna processing zone (J.P. Faivre, Inrap). (**b**) One of the sites from the Molinons site complex (France). Below, distribution plan of the material; above, interpretation. Zones of concentration I and II are dedicated to reduction, with secondary reduction in concentration II (zone E). The Levallois tools and blanks are grouped around the periphery (zones A–D). Some pieces were exported from the reduction zone toward the periphery zone. No refits link concentrations I and II, no doubt the work of the same group at different times (After Depaepe 2009b, DAO P. Depaepe)



European Middle Paleolithic: Geography and Culture, Fig. 4 Plan of Poitiers "La Folie" site (After Bourguignon et al. 2003) and attempt to reconstruct the site (P. Galibert, Inrap)

which revolved the activities of the group, with possible exchanges and sharing of food between hearths, which could reflect different family units. In level H, wooden plates of homogenous size have been discovered close to the hearths; their function is unknown, but a relationship with fire is obvious.

The activities practiced in these habitats varied: knapping flint, making tools, preparing skins, and butchery. But also the transmission of knowledge, learning, stories being shared, projects to discuss, and perhaps joys and sorrows to share, that is to say, everyday life.

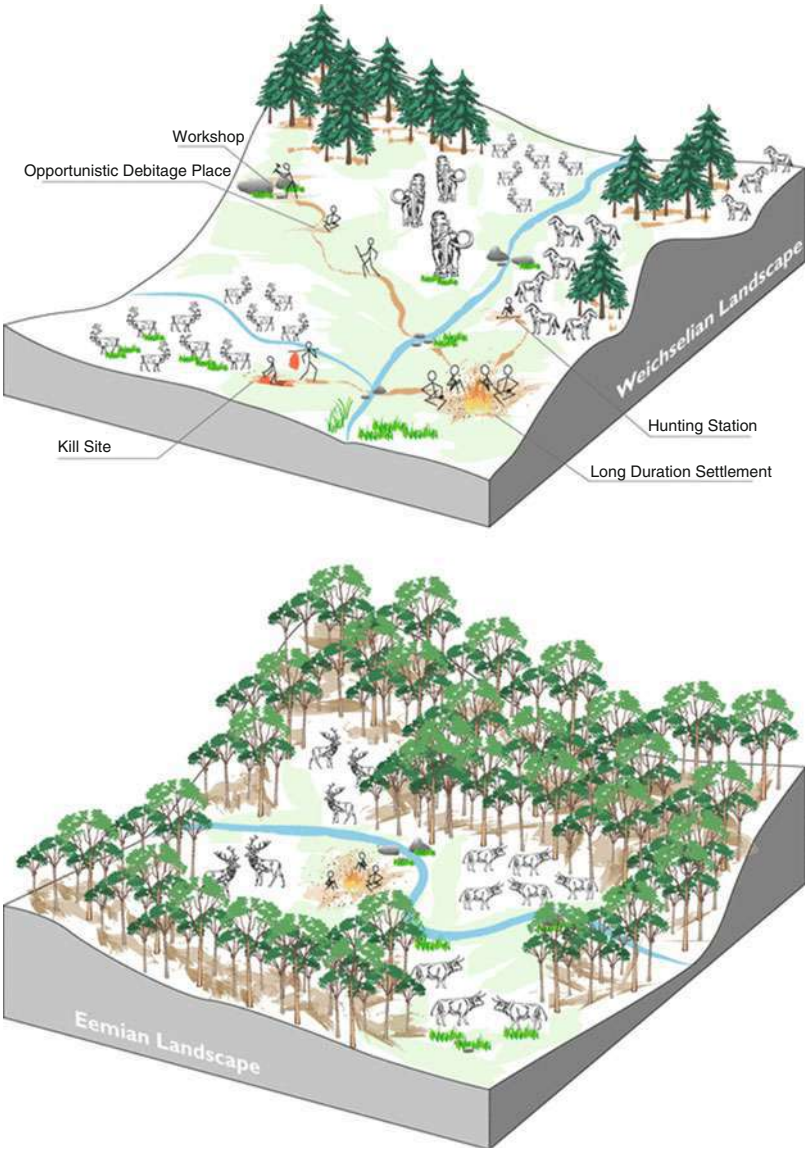
Territories and the Environment

A hypothesis has often been invoked linking the difficulty of Neanderthal to adapt to a temperate climate: such a climate would have deprived it of the large herbivores to which he devoted his hunts. Rare indeed are the sites which can be

dated to the Eemien interglacial (around 130,000 to around 115,000 BP; in a climate similar to the present day; 15 sites, for the most part in Germany: Lehringen, Taubach, Gröbern, Burgtonna, Neumark-Nord, e.g., Roebroeks et al. 1992; Speleers 2000). In France, these Eemian occupations are quasi absent in the south, and in the north, it is only at the site of Caours (where five archaeological levels are preserved; Antoine et al. 2006) that these can be unambiguously dated to the interglacial. These occupations are mostly preserved in lake sediments (travertine), and the scarcity of datable sites of the Eemian is certainly due in part to poor preservation conditions of human settlements.

However, it may well have been that Neanderthal inhabited forests to a lesser extent than the shrub-steppes where large mammals were plentiful. This seems to be confirmed by the rarity of Eemian occupations in caves.

The wooded plains environment specific to the Eemian certainly conditioned the size and location of human occupations (Fig. 5). These are in general small areas, often located at the edge of



European Middle Paleolithic: Geography and Culture,
Fig. 5 Reconstructions of human occupations in cold (above, Weichselien landscape around 70,000 BP) and temperate environments (below, Eemian interglacial, around 125,000 BP – after Depaepe 2009b, DAO S. Eusèbe/P. Depaepe, Inrap)

water holes – lakes, rivers, etc. It is important, however, to take into account taphonomic factors of the erosive phase following the Eemian which could explain the disappearance of occupations in other contexts. These Eemian occupations seem to present a large range of functions: knapping, tool use, etc. These may have been short duration occupations, providing evidence of a model of land occupation of high residential mobility.

Just as the forest environment of the Eemian determined the size and location of sites, it is likely that subsequent environmental changes had an impact on the size of occupations and their functions.

In regions where excavations are sufficiently numerous and large scale to allow for this type of analysis (France, Belgium; Depaepe 2010), it appears that it is mostly the slopes and plateaus that were occupied and that the size of the occupations increased in parallel with the progressive continentalization of the climate, generating more open steppe-like environments. In these landscapes, small or medium size occupations of short duration with specialized and sometimes unique functions (e.g., biface shaping, slaughter of a large herbivore, and initial butchery) seem to be related to more important sites, in terms of size and duration, with varied activities and from which a territory could be exploited (base camps called "residential site" linked to comings and goings to associated specialized sites called "logistical sites").

But this distinction is certainly not as dichotomous as that. During the Eemian, very brief and single-task occupations also existed: sites for processing large game, lithic raw material procurement sites, short-term knapping workshops, etc. Unfortunately, these sites are very difficult to discover, because of their very small footprint and the few artifacts needed for the activities to be performed. Among these, hunting is fundamental.

Food and the Acquisition of Food Resources

The anatomy of Neanderthals required substantial energy intake, particularly in cold climates: 6,000 kcal per day according to several researchers. Chemical analyses performed on Neanderthal bones have shown that they were large consumers of animal proteins: their diet approached that of the wolf.

Animal food resources were varied. Herbivores of medium size are very often represented: reindeer, bison, and horse; in temperate periods the Neanderthals hunted deer, wild boar, and cervids. Very large mammals were also hunted: in Lehringen (Germany) a spear was found stuck in the chest of an elephant. Nevertheless, we still do not know all the hunting methods of the Neanderthals. It seems that they used pole arms, like spears with a fire-hardened tip or a flint point (the French sites of Bettencourt-Saint-Ouen, Combe Brune, and Angé each yielded one Levallois flint point with wear showing their use as a weapon). Traces from hunting activities are thus evident, which does not preclude scavenging. The presence of an herbivore at many sites, overrepresented in comparison to others, points to evidence of hunting oriented toward this species (e.g., bison at the sites of La Borde, Mauran, and Puycelsi, France). The reason for this selection escapes us: opportunism, hunting strategies, cultural practices, or worship?

Small animals were also hunted: hare, birds, and terrestrial mollusks.

Recently, a traceological study showed actions of scaling fish with some lithic tools. It seems, however, that fishing was relatively rare, but this may perhaps be because of problems involving the preservation of fish remains. Marine shells were consumed (Bajondillo Cave, Spain, around 150,000 BP), and at Gibraltar, mussels were cooked and seals consumed.

Very recently traces of cooked plant foods have been documented at sites as distant as Shanidar (Iraq) and Spy (Belgium) (Henry et al. 2011); since then studies have been extended to other sites and have confirmed preliminary data (Henry, personal communication). This is an important element in the understanding of Neanderthal food consumption practices in comparison to those of AMH. Nevertheless, these studies cannot as yet provide an estimation of the respective proportions of animal and plants resources in the Neanderthal diet.

Industry: Raw Materials

Comprehensive understanding of their territory allowed Neanderthals to acquire the raw materials

needed to make tools. They mainly worked with hard stone; tools made of perishable materials such as wood were no doubt frequent but have mostly disappeared. Some traces, however, still exist: spears or lances at Lehringen, pointed sticks at Königsaue (Germany) and Krapina (Croatia), and plaquettes placed near hearths at Abric Romani (Spain). The Königsaue site has also yielded evidence of hafting systems of a bifacial piece on a wooden handle using birch resin (Grünberg 2002). These few elements are certainly only a pale reflection of the use of wood in Middle Paleolithic technology, which is also shown by use-wear studies on flint, although traces of woodworking can sometimes be confused with taphonomic phenomena caused by burial in periglacial context (Caspar et al. 2003). It is important to note that wood is found at sites during the Lower Paleolithic in Clacton (England), Schöningen, and Bilzingsleben (Germany), also showing the continuum between the Middle and Lower Paleolithic.

By contrast, the explanation for disappearance due to taphonomic reasons does not hold for bone, frequently preserved on sites as consumption waste but, for reasons that escape us, rarely used by Neanderthals (some retouchers and bifacial pieces in bone or ivory, as at Rhede, Germany). Some authors have postulated cultural taboos and rituals, taboos prohibiting the use of tools made of bone, wood, tusks, and horns of killed animals, although their presence is attested in graves.

Studies of lithic raw materials are based mostly on their provenance, defining local or exotic materials based on the distance from the site where they were found. Mousterian groups had a very opportunistic behavior in relation to raw materials: they mainly use local materials, even if their quality was not the best. In relation to a site, the provenances of the raw materials used (the sources) were often nearby, rarely more than a 100 km away. The Mousterians were certainly among the prehistoric humans those who used the broadest diversity of stone to make their tools.

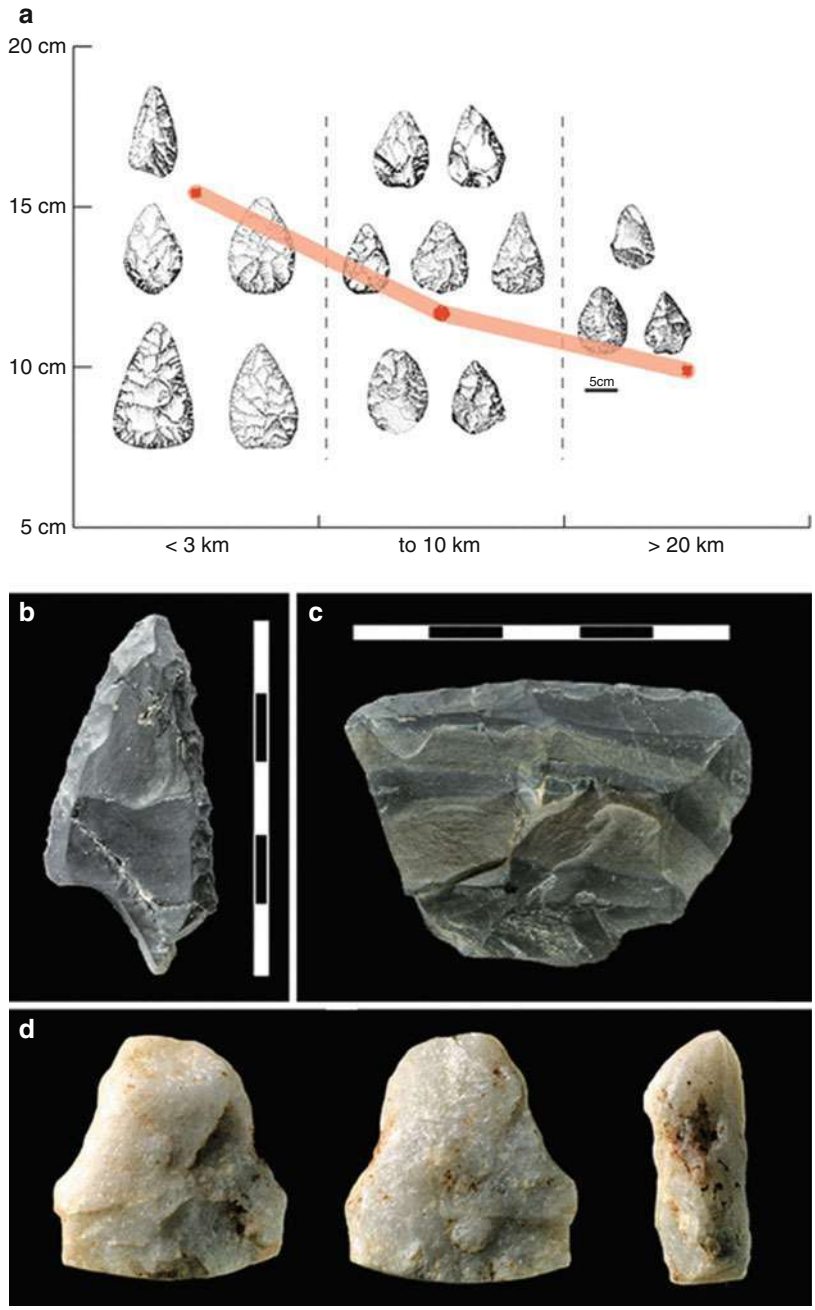
Flint is undoubtedly the most common material used. If we take the example of the French territory, it largely dominates the lithic industries in the north, the Paris and Rhodanian Basins, Burgundy, the north Aquitaine basin, part of Provence, and the Alpine foothills. Quartzites were taken from the Pyrenees to the Garonne, quartz from Quercy, basalt from Auvergne, dolerite in Britain (with phtanite) and in the Massif Central, etc.

Proximity of the raw materials appears to have been an important criterion: in the very heart of flint-rich regions (e.g., the north of France), some sites show dominant use of sandstone, a local material, over flint of better quality but whose deposits were a bit further away.

Despite this, artifacts of nonlocal materials are nearly always present at sites, but in small quantities. These artifacts are for the most part retouched tools or unretouched flakes with a cutting edge, and thus usable as such for cutting, or destined to be transformed into a tool; they are in this case considered as a material reserve. Two observations have been made about these pieces: firstly, their proportion within the totality of material decreases with the distance from the source; next, these are nearly always pieces showing high technical investment, and not flakes from core preparation (such as cortical flakes and flakes produced during maintenance of flaking surfaces). These particular pieces probably constitute individual equipment, transported from one place to another, and sometimes abandoned to be replaced by new tools when their use became obsolete. These tools sometimes have a complicated "life": a flake may well be revived several times during its existence as a tool, each time adopting a new form, more reduced than the preceding one (Fig. 6).

Lithic Technologies

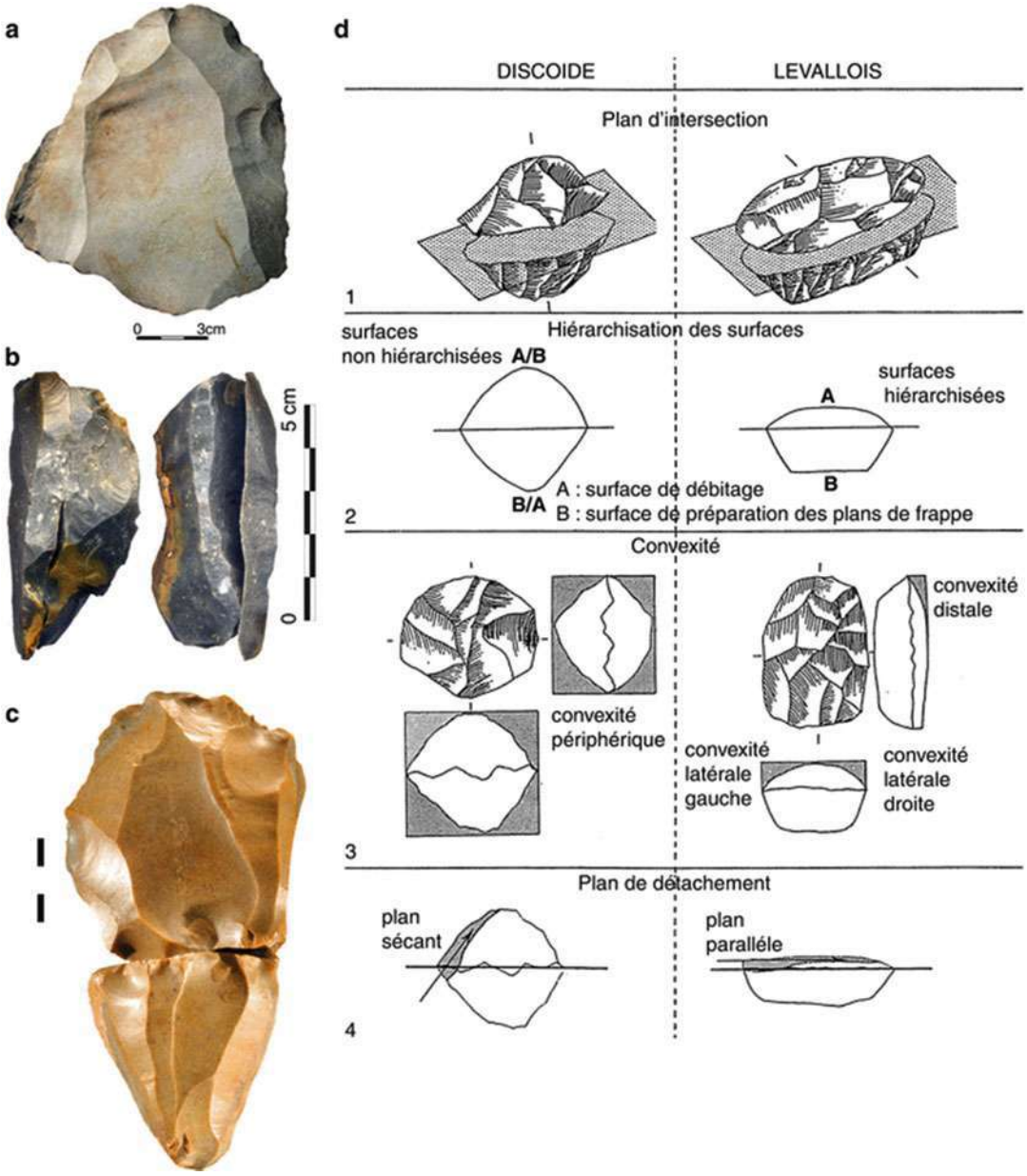
Several flake production systems were employed by the Neanderthals. The most famous is the "Levallois" method, named after the municipality close to Paris where flakes and cores of this type were discovered in the nineteenth century. This system was described at the beginning of the twentieth century by Victor Commont, then by François Bordes in the 1960s, and Eric Boëda in the 1980s, who clarified the concept, the latter identifying several methods within the Levallois system in order to obtain different products. The



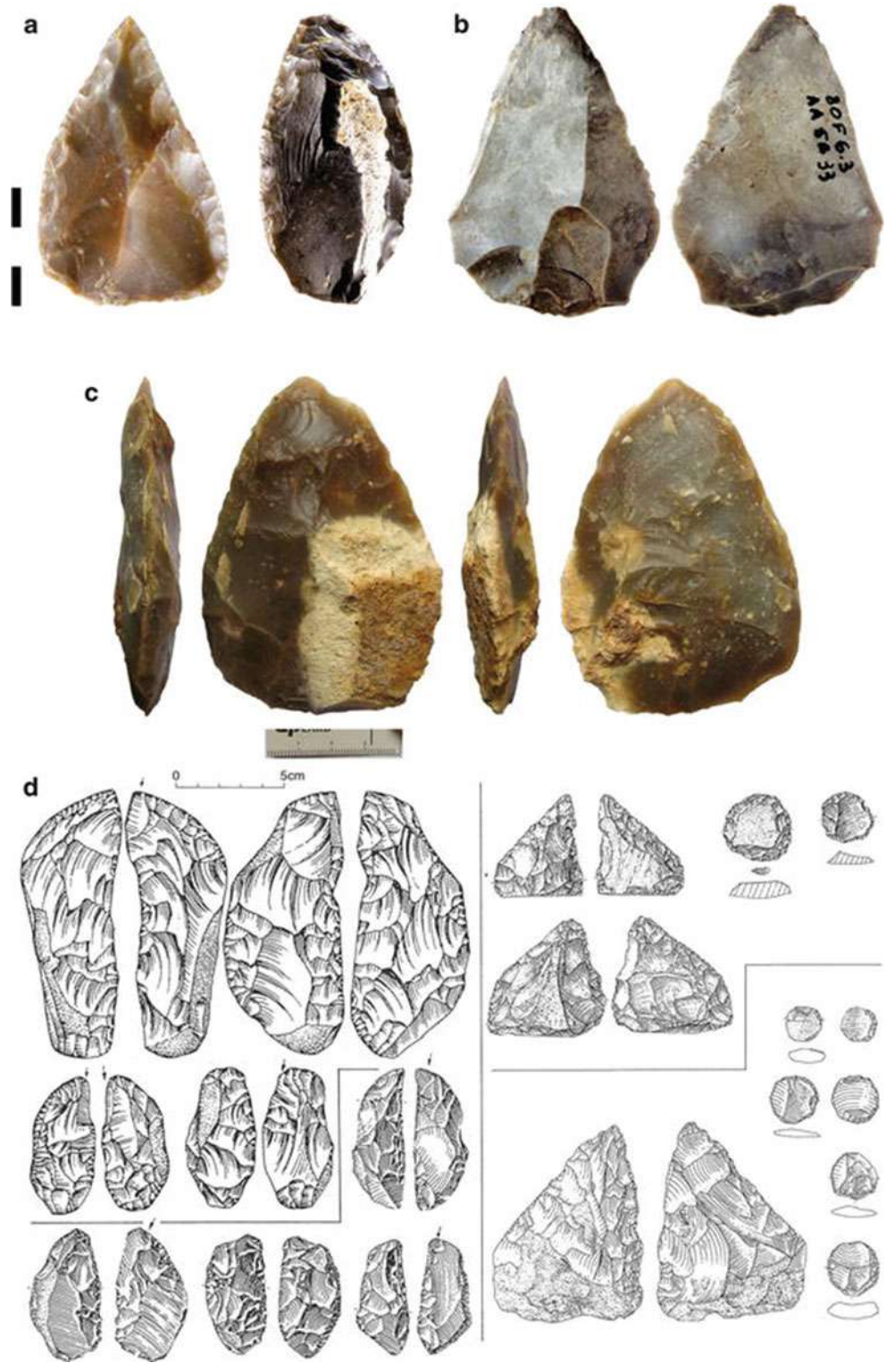
European Middle Paleolithic: Geography and Culture, Fig. 6 (**a**) The size of these bifaces decreases with increasing distance to the raw material source, as they have been reknapped several times during their use at different locations before being abandoned (After Depaepe 2009b, DAO P. Depaepe, Inrap). (**b–d**) Examples of raw materials (**b**: lydian point, **c**: quartzite scraper) (these two last from the Grotte du Noisetier, France, photo J. Viguier). (**d**) Quartz notch (4.9 cm; Fieux site, France, photo Vincent Mourre)

Levallois production systems first appeared around 300,000 BP and became widespread during the Middle Paleolithic where it is a characteristic element. Levallois reduction is based on a concept of predetermination, which illustrates the mental capacities of the users: the

core is prepared in such a way that its volume has two complementary surfaces, one destined for preparation and the other for the production of flakes (Fig. 7). Among the different production systems used by the Mousterians, Levallois is the one that offers the widest range of products: flakes, points, and blades can be produced depending on the method used. Even if it was used at other times and in other places, the Levallois system constitutes the common base of Mousterian technology and its distribution covers almost the whole of the Old World.



European Middle Paleolithic: Geography and Culture, Fig. 7 (**a**) Preferential Levallois core (Garris II, France, L. Bourguignon, Inrap). (**b**) Refit on a blade core (Saint-Hilaire-sur-Helpe, France, P. Feray, Inrap). (**c**) Levallois and blade core on the same block (Cantalouette IV, France, L. Bourguignon, Inrap). (**d**) Levallois and discoidal reduction (After Boëda 1993)



European Middle Paleolithic: Geography and Culture, Fig. 8 (continued)

Discoidal reduction appears to have been older than Levallois reduction, its presence attested in Africa a million years ago. During the Middle Paleolithic, it occupied a large geographical and chronological range. Discoidal reduction produced short and wide-backed flakes, due to the alternation of knapping on the two equally important surfaces of the core. Another reduction system called Quina produces thick flakes of triangular section that has a sharp retouched edge opposite an unretouched back. Quina reduction is quite recent in the Middle Paleolithic, between 70,000 and 35,000 BP, and is more geographically limited than the discoidal technique.

Volumetric blade production consists in exploiting the volume of the block, in contrast to Levallois which exploits the surface. It was long considered to be exclusive to the Upper Paleolithic, and thus "modern." The quite recent discovery of blade production in the Middle Paleolithic therefore compelled the revision of the dogma surrounding its modernity. In our present state of knowledge, blade production is limited in time and space: it made its appearance appeared in isotopic stage 6 (around 180,000 BP) in the north of France and became quite common during isotopic stage 5, between 115,000 and 70,000 BP. It suddenly disappeared never to return along with the abandonment of this region during the glacial maximum of MIS 4. Blade production existed in Poland between 60,000 and 35,000 BP, as well as in other regions such as southwest France.

Other reduction systems, more limited in time and space, are also used, including reduction on anvil, the Le Puchueil type, Kombewa, and SSDA, among others. It is also important to take into consideration unorganized reduction, frequent but much less commonly described in the study of lithic industries (note that lithic studies are not typically focused on how reduction techniques are learned and archaeological evidence of such apprenticeship).

Finally, the shaping of bifaces is also present in the Mousterian, although to a lesser degree than during the Acheulean. Mousterian bifaces are different in their concept from their predecessors: the Acheulean biface is a tool in itself; the Mousterian biface is an object supporting tools. The structure of the Mousterian biface gives it the double advantage of having edges that could be retouched and hence transformed into sidescrapers, due to its plano-convex and not biconvex profile like Acheulean bifaces and its ability to be transformed many times. This characteristic means that bifaces could be mobile objects, transported, used and transformed from one point to another, and finally abandoned when they no longer met the needs of their owners.

The range of blanks designed to be transformed into tools is thus vast (Fig. 8). Yet all tools are not retouched: traceology has shown that a number of unretouched flakes were also used, essentially for cutting. Retouching allows resharpening of its edges, as well as strengthening and smoothing, but the absence of retouch thus does not mean lack of use. Tools called "domestic" are largely dominant compared to objects that could serve as weapons like some Levallois points. In the domestic tool kit, sidescrapers are the most common. These tools are flakes where one or both sides are retouched and designed to deflesh, cut, and process hides for tanning reinforced by the action of mineral substances like ochre, in order to prevent rotting. The many kinds of sidescrapers, which vary according to the location of retouch, form, etc., define many types often used as cultural markers. Notches and denticulates are also frequent tools, at least in some regions; the north of France, for example, is basically devoid of them. Such tools with retouched edges in the shape of a rudimentary saw may have been used to process wood; they were also very effective in the disarticulation of limbs (cutting of tendons).

European Middle Paleolithic: Geography and Culture, Fig. 8 (**a**) Mousterian sidescrapers (Cantalouette II, France, L. Bourguignon, Inrap). (**b**) Levallois point used as a lance point (Bettencourt-Saint-Ouen, France, J.L. Locht, Inrap). (**c**) Mousterian biface (Combe Brune II, France, M. Brenet, Inrap). (**d**) Micoquian tools (Sesselfelsgrotte, Germany; Kulna, Hungary; after Richter 2000)

Industries and Cultures

Concepts

Due to their preservation, knapped stone tools were used as the basis for the definition of "cultural systems." This approach is obviously simplistic, a bit as if our current "culture" was studied only through the tools of a handyman in his workshop. Nevertheless, they serve as the basis for the definition of "cultures" in the Middle Paleolithic, which thus must be considered with caution.

In the 1950s, François Bordes developed a statistical method, based on the typology of Mousterian tools, allowing for the classification of industries into four or five groups in order "to reorganize the Mousterian morass." According to him, the differences recorded between the industries were cultural, applicable to the last glaciation (between 125,000 and 35,000 BP, or the recent Middle Paleolithic) and thus correspond to as many human groups.

Other archaeologists have, however, proposed different interpretations for this observed variability. Since 1916, Victor Commont contrasted the open-air sites in northern France, in close proximity to raw material sources and with often non-retouched flakes with the sites of the Périgord caves, located far away from the raw material sources and where tools were intensively retouched. In the 1970s, Lewis Binford hypothesized that the Mousterian facies were in fact a reflection of different activities, while Paul Mellars saw in these a chronological sequence, at least among some of them.

The archaeological truth, provided one can ever get near it, is most probably a combination of all three. Some features are more recent than others or limited to specific regions. Their distance vis-à-vis raw material sources leads to more intensive use of tools, which are thus both reduced and more retouched. Some sites are oriented toward particular functions and this specialization can have an impact on tools. Finally, it is undeniable that cultural aspects had an important influence on the composition and the typology of lithic assemblages, influenced by stylistic traditions.

Cultural Systems

The Middle Paleolithic can be divided into two major phases. The first is called the Early Middle Paleolithic and ranges from around 300,000 BP to the beginning of the Eemian Interglacial (around 125,000–115,000 BP, isotope stage 5e). The second, the Late Middle Paleolithic, goes from the Eemian to the disappearance of the last Neanderthals, around 35,000–30,000 BP depending on the region. The second phase corresponds largely to the Weichselian glaciation (isotopic stages 5–3). This subdivision is questioned by some authors but nevertheless presents the advantage of simplifying the vision of these 250,000 years of the Middle Paleolithic.

The cultural systems of the Early Middle Paleolithic are not clearly defined as sites still remain relatively rare for this period. Since isotopic stage 10, tools of Mousterian style appear (e.g., thick sidescrapers from La Micoque, France), accompanied by Acheulean bifaces. During isotopic stages 9 and 8, Levallois production is present, and its flakes serve as blanks for typically Mousterian sidescrapers; some bifaces persist. During isotopic stages 7 and 6, blade production appears; Levallois flakes are retouched into Mousterian points, sidescrapers, etc., and large Levallois points complete the tool kit. Some industries still have an Acheulean bifacial element.

The Late Middle Paleolithic is better known, with the exception of the Eemian (isotopic stage 5e poor in archaeological sites). Its premises are firmly in the early phase (reduction methods, tool types), but most sites have led to a multiplication of "cultures."

For this recent phase, François Bordes thus defined five main Mousterian groups: the Mousterian of Acheulean tradition characterized by the presence of bifaces; the Denticulate Mousterian; the Mousterian of Quina type, very rich in sidescrapers intensively retouched but without Levallois reduction; the Mousterian of Ferrassie type which resembles that of Quina, but with Levallois reduction; and finally the Typical Mousterian with the different types of tools in a "harmonious" balance. Defined from sites in southwest France, this classification had a resounding success, leading many archaeologists from other regions, and even other countries, to assimilate their findings with one or other of these groups, with varying success and some exaggerations. It now appears that these features have

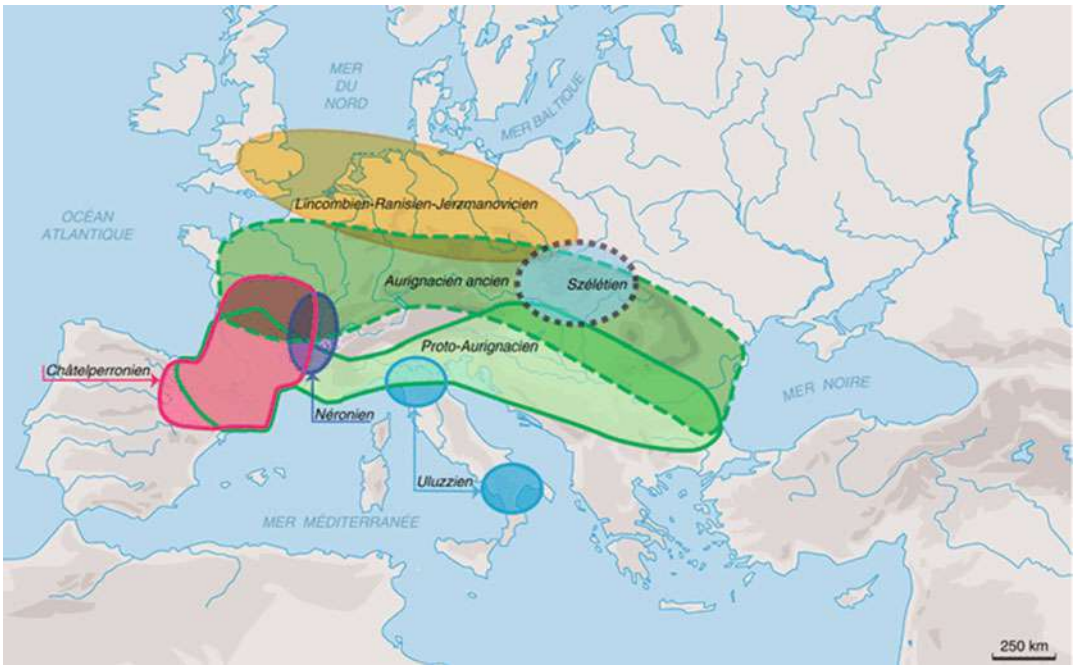
nearly no validity outside their zone of origin, which moreover only increases the variability of Mousterian expressions.

Thus, a number of "cultures" are defined, usually with a regional recognition (stylistic traditions). In Central and Eastern Europe (from Germany to Volgograd, Russia) several groups generically coming together under the term Micoquian become individualized by the presence of bifacial pieces (Keilmesser, Prondnikmesser, Faustkeilblätter, etc. – Fig. 8d). The first Micoquian phase, sometimes called "Keilmessergruppen" (around 60,000, perhaps earlier, to 40,000 BP), is followed by a second phase, the "Blattspitzengruppen" (leaf points), considered Late Micoquian. Contrary to popular belief, some of these groups employed Levallois reduction (Richter 2014). The Hungarian Babonyen appears to be connected with the Micoquian in its first phase, and the Szeletian (northern Hungary, Slovakia, Moravia, Southern Poland) later includes foliate tools similar to the Final Micoquian (the Altmühlian seems to correspond to the equivalent of the Szeletian in Bavaria).

An earlier industry, the Taubachian in Central Europe, characterized by thick flakes produced from small pebbles and used tools with deep retouch and by some microlithization, would be for some authors a survival of archaic traditions. Nevertheless, its near systematic association with interglacial contexts and lake environments (lake banks) suggests rather an adaptation to a particular context. This could also be valid for the Pontinian at Latium (Italy).

The period around 38,000–30,000 BP saw the appearance of "transitional" industries (from the Middle Paleolithic to the Upper Paleolithic – Fig. 9). These are industries in the final phase of the Middle Paleolithic, which for some researchers include Upper Paleolithic traits (blades, burins, end scrapers, etc.). This does not necessarily mean that they were influenced by the Upper Paleolithic industries that originated outside Europe. A common characteristic of these industries is the production of armatures for projectiles (points).

From around 38,000–30,000 BP, the industries grouped under the term Lincombian-Ranisian-Jerzmanowician (LRJ – see Flas 2008 for a



European Middle Paleolithic: Geography and Culture, Fig. 9 Europe between 38,000 and c. 33,000 BP (DAO AFDEC, after P. Depaepe 2009b, modified)

detailed approach) occupied a vast area across the northern plains of Europe, from Wales to Poland. These "transitional" industries are characterized by a particular type of leaf point made on blades. A few Polish industries like the Zwierzyniecien show blade production (laminar industries existed since the beginning of isotopic stage 3 in the south of Poland, at Piekary and Krakow "Ksiecia Jozefa"). Further east, the Streletskian, with bifacial points, sometimes with a concave base, sees its origin in the Late Middle Paleolithic of the Crimea or the Russian plain.

The Châtelperronian developed in southwest France and northern Spain, of which the characteristic tool is the Châtelperron point (armature on blade, with a curved back created by abrupt retouch). In Italy, the Uluzzian presents similarities with the Châtelperronian, albeit less strongly laminar. But there are strong probabilities that Uluzzian is an AMH industry, not a Neanderthal one (Benazzi et al. 2011.

Nonutilitarian Preoccupations

Evidence of symbolic expression in the Middle Paleolithic is rare: a few cases, less than 30 (Otte 1996; Jaubert 1999, 2010; Soressi and D'Errico 2007; Soressi 2009.). Indeed, extensive taphonomic studies have led to the elimination of many artifacts that were found to be natural products, such as the "Neanderthal flute" of Divje Babe, Slovenia, which is still the subject of intense debate within the scientific community, and many bones whose "engravings" are actually signs of vascularization.

In Europe, some evidence linked to the Neanderthal sphere are essentially made up of incisions on stone artifacts or bones, traces of pigment use, collections of odd pieces, and some jewelry in the Chatelperronian levels.

A few flint artifacts and pebbles have incisions that are not structured (flint from Champlost and pebbles from Chez-Pourré-Chez-Comte, France; Tata fossil, Hungary; shale plaquettes from Temnata, Bulgaria). Again on stone, the famous slab from the Ferrassie burial (France) should be mentioned, with shallow depressions on its underside (see below), likewise the scratched floor of Gorham's Cave (Gibraltar; Rodríguez-Vidal et al. 2014). On bones, a severe taphonomic revision has left only the rarest elements, the most compelling being an engraved bone with zigzag signs at Bacho Kiro (Bulgaria).

A few fossils were discovered in some habitats (polypus and gastropod fossils from Hyena Cave, Arcy-sur-Cure; brachiopods at Pech de l'Aze I and Chez-Pourré-Chez-Comte, France). In some cases these fossils were transported from many kilometers away, but the reasons for this collection elude us: symbolism attached to "stone animals," simple curiosity, and playful approach?

The use of natural pigments is clearly evident at more than 70 archaeological sites during the Middle Paleolithic. These are mainly manganese and ochre; blocks show very clear traces of abrasion on the surfaces which reveal intentional usage (e.g., at Pech de l'Aze I and IV, Fig. 10), in some cases perhaps functional (ochre has an antiseptic function in addition to its coloring component). At Néron Cave (France), a color container (hematite) was found arranged in a pebble. At Cueva de Aviones (Spain), marine shells impregnated with dyes have been discovered.

The register of ornaments is also very poor: some pierced teeth and bone pendants in Chatelperronian levels (Grotte du Renne at Arcy-sur-Cure, Grotte Quincay, France). In the Uluzzian pierced shells have been discovered.

But the lack of traces of symbolic expressions should not obscure a potential taphonomic problem. In fact, we cannot rule out the possibility of symbolic expressions that are now invisible in the archaeological record, such as tattoos, body painting, drawings on sand or perishable materials (bark, skins, etc.), masks, or jewelry. Thus, at Abri Fumane, raptor bones show signs suggesting the removal of feathers, in an esthetic intention according to the authors (Peresani et al. 2011). Despite the controversy concerning the "flute" of Divje Babe, the manufacture of nonutilitarian objects (in the strict sense of the term) remains conceivable (whistles, flutes, rhombs, percussion, or other musical instruments are no longer present due to the conditions of preservation of their supports in organic material).

It should be noted that as far as we know, these traces of nonutilitarian expressions are

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Fig. 10 Blocks of colorant (Pech de l'Azé I; left block measures 27 mm; photo M. Soressi, Inrap)

attributable to the final stage of the European Middle Paleolithic, after 60,000 BP. They could thus be the result of local evolution of Neanderthal societies, also linked with the appearance of burials, again around 60,000 BP in Europe.

Similarly, such traces of expression remain modest in comparison to the extraordinary artistic flowering of anatomically modern humans (parietal art, portable art). These findings should be taken into consideration when discussing the abstract capacities of Neanderthals, while trying to retain a balance between an overvaluation and a denial of these capabilities, these extremes being untestable and emerging from dubious comparisons with our own abilities.

Outside the Neanderthal sphere, there is evidence of expression which seem older (at least 80,000 BP) as, for example, pierced shells in Morocco and Israel, engraved ostrich eggs (Diekploof, South Africa), and engraved stones (Blombos, also South Africa).

Death and Then? Funerary Practices in the Middle Paleolithic

Around 20 Neanderthal burials have been discovered so far, of which a third are found in southwest France (Maureille 2004; Vandermeersch et al. 2008). Their recurrence in certain sites suggests the existence of necropolises, sites favored for the burial of members of the same group (e.g., seven subjects at La Ferrassie, France). These remains include both men and women and neither does there seem to be a selection linked to age.

These burials dug within habitats themselves were not intensively structured: generally shallow vaguely rectangular or oval pits sometimes protected with a cover (stone blocks or slabs, as at La Ferrassie (France) where a slab with shallow depressions covers a child's grave). The corpse was placed directly in the grave together with an occasional piece of burial goods (flint tools, bones, deer antlers, etc.). The presence of some bedding is hypothesized at Shanidar 4. In certain cases of constrained disposition, bonds may have possibly secured the corpse.

Secondary funerary practices are also likely to have taken place: multiple reburial of the corpse, removing the skull after the disappearance of flesh; similarly, isolated skulls are sometimes discovered at the sites. These elements suggest a form of religion. Traces on some skulls also show the removal of the scalp.

Cut marks appear on some bones, indicating removal of flesh, but the intentions of this practice remain unknown: endocannibalism for food or

ritual purposes, cleaning the bones of the deceased, and food cannibalism (El Sidrón cave, Spain; Lalueza-Fox et al. 2011). The comparison with cut marks from animal bones invokes the recovery of meat for consumption, without it being possible to determine whether such a practice was integrated within a ritual. It is important to note that in southwest France, such practices concern Mousterian sites of Quina type, which suggests a cultural component to this practice.

Neanderthal burials can be dated within a range between 60,000 and 40,000 BP, that is, in the final phase of the European Middle Paleolithic. Burial practices, however, are known earlier, around 100,000 BP in the Middle East (Qafzeh and Skhul, Israel), but these were anatomically modern humans with a Mousterian industry. However, recent evidence suggests an earlier date than what is generally accepted for some burials in southwest France (Jaubert 2010); if confirmed, these new dates are important to the debate on the originality of the sepulchral act, between Neanderthals and anatomically modern humans.

Toward a New World: The End of the European Middle Paleolithic

Neanderthals disappeared from the European scene between 35,000 and 28,000 BP depending on the region in Europe, where he was replaced by anatomically modern humans (AMH) who reached the European continent around 37,000 BP (Proto-Aurignacian in southern Europe). However, Neanderthals and AMH had already crossed paths in the Middle East, at least around 60,000 BP (perhaps earlier): they shared the same culture (Mousterian), buried their dead (see above), and analyses of the human genome show cross-breeding.

Until 37,000 BP, the Neanderthal was the only human to occupy Europe. Then, over a few 1,000 years, he disappeared, at the same time that AMH made its entry, which is rather late compared to other regions in the world which they seemed to have reached earlier, around 60,000 BP, for example, in Australia. In Europe, the oldest AMH fossil is the one discovered in Oase (Romania); it dates from around 35,000 BP, but unfortunately is not clearly associated with archaeological material, which prevents it from being associated with a specific cultural current.

Modern humans reached a Europe which seemed to be in great turmoil. Indeed, from about 38,000 BP, the world of the Neanderthals went through several currents which, although based on a Mousterian substrate, significantly altered the cultural landscape of the Late Middle Paleolithic: the "transitional" industries (cf. above). These millennia are marked by the climatic warming of Les Cottés interstadial (or Hengelo depending on terminologies used) (between 38,000 and 35,000 BP), succeeding a brief, but very cold, climatic episode (the Heinrich 4 event). Benefiting from this warming, Neanderthal populations were able to significantly expand their territories, but since their overall population size remained stable, the density of the population would de facto have dropped (Maureille 2008). This dispersion led to a reduction, or even a discontinuation, of contacts previously maintained between groups, which would have been a factor for cultural stability. This would have resulted in this incredible disparity, some groups developing a new cultural system on a Mousterian substrate, others preserving Mousterian traditions.

The extreme end of the Middle Paleolithic seems thus to correspond to the Neanderthal world experiencing a rupture in their cultural balance, with groups sharing less or not at all, and therefore becoming culturally and demographically weakened. The last Neanderthals disappeared from France around 35,000 BP, possibly 32,000 BP, in the southwest. In remote areas (refugia), they persisted later: southern Spain and Portugal until 28,000 BP or for some authors 24,000 BP (Gibraltar, but this date is disputed), perhaps also in some areas of the Balkans or in Byzovaya (see above).

There was therefore on the European scale a coexistence between Neanderthals and AMH, for varying periods depending on the region, but this cohabitation does not necessarily mean contacts: the weak genetic contribution of Neanderthals in current European and Asian genomes seems to derive from encounters which occurred in the Middle East, not more recent ones. It is possible that Neanderthals had already undergone a phase of demographic reflux and that entire regions had been abandoned, AMH therefore arriving in a human desert. In other places, the two groups may have occupied the same territory and

competition for food resources may have well been fierce between AMH and Neanderthals (Banks et al. 2008), these resources remaining identical for an overall increased population. For reasons which elude us (better social cohesion? better technology? better demography?), AMH won this competition. Other hypotheses, which may also be cumulative, have also been put forward: epidemics, conflicts, etc. (see Depaepe 2009b for different scenarios). Regardless, Neanderthals were definitively replaced by AMH after –30,000 BP.

Conclusion: Neanderthal Heritage

Who, therefore, was the Neanderthal? A typically European human, having only expanded slightly beyond this continent. A man perfectly adapted to his environment, withstanding important climatic changes for more than 200,000 years. A man with a culture, the Mousterian, which even if shared with anatomically modern humans in the Middle East, is no less a very European culture, with regional specificities. It is during the Mousterian, indeed, that Europe constructed an identity different from other regions of the world. A man whose clans roamed varied landscapes, hunted for big and small game, and made tools developed by complex and diverse systems. A man who no doubt questioned himself, who buried his own, who may have developed a mythology, rituals, and beliefs. A man who took care of his relations, as is shown by some skeletons with such pathologies that the survival of these individuals without the help of their relatives would certainly have been impossible. Another man, a cousin, at once so close to us and so far away, who left a little of himself in our genome.

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European Middle to Upper Paleolithic Transitional Industries: A Socioeconomic Approach

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State of Knowledge and Current Debates

Introduction

It is generally assumed by most scholars that the European Middle Paleolithic (MP) to Upper Paleolithic (UP) transition is the result of the arrival of modern men groups in Europe and replacing the Neanderthals. Since 20 years, scholars have tried to identify the way of circulation of the first Aurignacian groups inside Europe from the east (e.g., Djindjian 1993). More recently, in the first general synthesis on European Upper Paleolithic (Djindjian et al. 1999), the chapter concerning this question has been opened with two different hypotheses, the first one with the arrival of the modern man with the Aurignacian material culture and the second one with a systemic change due to the context of the interpleniglacial of OIS 3. For the readers unfamiliar with that question, a history of the last 150 years of researches on the beginning of European Upper Paleolithic has been recently

given (Djindjian 2006). More recently, a method has been proposed to reconstitute the mobility inside the territory of European Upper Paleolithic human groups using data from site mapping, raw material procurement circulation, dwelling seasonality, and food resource management inside the annual cycle (Djindjian 2009a). The method is applied here to the period 75,000–34,000 BP (OIS 4 and OIS 3). It is then possible to argue a new model, based on the explanation of systemic changes in the economic and social organization of human groups and then their material culture, due to the adaptation to a changing environment. The model has the virtue to be independent of the eventual actors of the material culture, whatever they are.

The European Middle Paleolithic (MP)

The studies of the European Middle Paleolithic are limited since 100 years by several major difficulties:

- The lack of absolute dating before 40,000 BP, over the range of the radiocarbon method, which has been slowly improved by the use of alternative techniques like thermoluminescence, uranium-thorium, or ESR, which have unfortunately a reliability and a precision much weaker than radiocarbon dates
- The data of lithic assemblages based on the Bordes typology (Bordes 1961), which are showing a lack of space and time structures at the origins of the famous historical controversy between Bordes (1953) promoting some kind of undefined Mousterian groups, Binford and Binford (1966) promoting a mistaking functional site analysis, and Mellars (1969) trying unsuccessfully to extract a chronological structure from the nonchronological Bordes typology
- The data of lithic assemblages based on a core reduction sequence analysis, which are renewing insufficiently the results of Breuil and Kozlowski (1931–1934) in the beginning of twentieth century, because they consider them as a technical typology (replacing the Bordes morphological typology) and not as a manufacturing process

Nevertheless, the previous contradictions may be revisited by several new approaches like:

- The raw material procurement studies, which are showing in Middle Paleolithic industries the use of raw material of very various quality of stone (flint, radiolarite, quartzite, etc.) collected at very short distances from the dwellings
- The core reduction sequence analysis, viewed as a manufacturing process, focusing on the very early emergence of blade and bladelet technologies and the strong correlation with the raw material procurement
- The stratigraphic correlations at a regional scale, revisited by new environmental analyses and better absolute dates

It is not possible, here in a limited space, to propose a new chronostratigraphy of the Middle Paleolithic European industries and to argue it in an enough detailed approach, site by site. Based on Middle Paleolithic data assemblages using a simplified typo-technological list and revised chronostratigraphic site sequences, new results are used to argue the present analysis.

The Middle Paleolithic Assemblages

The revision of the famous typology of François Bordes (1961) is revealing that the decomposition of types in subtypes is, in most of cases, artificial (e.g., for scrapers and hand axes) involving in a much more limited number of types than the hundred types of the reference list: points, side scrapers, notches, denticulate and other retouched pieces, knives, hand axes, and Upper Paleolithic types.

At the opposite, the technological information is not complete, individualizing only the Levallois technique and neglecting other well-known Middle Paleolithic techniques like discoid, Quina, bifacial, blade prismatic, and bladelet prismatic manufacturing processes, without forgetting the use of multi-integrated manufacturing process ("ramification").

In a very interesting paper, Callow and Webb (1981) have processed a PCA (principal

component analysis) of 96 Mousterian assemblages from southwestern France, described by 15 ratios elaborated directly from the types and the technical indices of the Bordes list.

The first factorial axis is opposing the assemblages rich in side scrapers to those rich in notches and denticulate. The second axis is ordering the assemblages by the abundance of Levallois artifacts. The third axis is ordering the assemblages by the abundance in Upper Paleolithic types and hand axes. The point diagram in the two first axes is showing a continuum (and not a partition) of the classical Bordes Mousterian facies: denticulate, typical, Ferrassie, and Quina. The so bad named "Mousterian of Acheulean tradition," which is, chronologically, the latest Mousterian of the area, is individualized on the third axis. These results, though limited to the southwestern France, are very important:

- Firstly, they are showing a chronological component in the Mousterian assemblages, as supposed by Mellars, but unfortunately masked by other structures, when processing Mousterian assemblages.
- Secondly, they are showing that the main variability of the assemblages is based on the opposition between side scrapers and notches/denticulate. Such variability has no any spatial or chronological links, but is correlated with the raw material procurement (see below).
- Thirdly, the important role of the Levallois technique variability has to be pointed out, anticipating the role of the variability of the different core reduction sequences. Unfortunately, the abundance of the Levallois technique cannot be correlated here with the other core reduction sequences and separated between flake Levallois and blade Levallois techniques.

Compared with the Upper Paleolithic stone industry, the Middle Paleolithic lithic industry is characterized by a strong individual variability. A part of this variability is due to intrinsic factors which allow, at several scales (individual, group), a large liberty of manufacturing inside the choice of one or more among the set of known core reduction technologies. But it is also possible to affirm that a part of the variability of the Mousterian assemblages may be explained by other extrinsic processes. To identify them, the only method is the correlation between techno-morphological studies of the artifact assemblages and extrinsic data like chronology, territory, environment, and raw material procurement distance, able to reveal other processes at the origin of the variability.

It is then an illusion to conclude to the superiority of the Upper Paleolithic stone technology over the Middle Paleolithic lithic technology. The internal dynamism of various techniques is characteristic of the Middle Paleolithic manufacturing, while the standardization is characteristic of the Upper Paleolithic manufacturing.

A Chronological Structure in Middle Paleolithic Assemblages

There is a chronological structure in the variability of the Mousterian assemblages:

- Isotopic stage 7 (250,000–200,000 BP) corresponding to an interglacial phase. The assemblages are showing the apparition of the Levallois technique (defining the beginning of Middle Paleolithic) in a general flake core production industry. But blade technology is also known.
- Isotopic stage 6 (200,000–135,000 BP) corresponding to a glacial phase. The assemblages are showing the importance of the Quina technology (side scrapers).
- Isotopic stage 5 (135,000–75,000 BP) corresponding to an interglacial phase. The assemblages are showing the abundance of the Levallois technique. The blade prismatic core technology is present.
- Isotopic stage 4 (75,000–60,000 BP) corresponding to a pleniglacial period. The assemblages are showing a dominance of side scrapers and/or notches/denticulate types. The Levallois technique is decreasing progressively at the transition between the isotopic stages 5 and 4.
- Isotopic stage 3 (60,000–34,000 BP) corresponding to a interpleniglacial phase:

At the beginning of OIS 3, the assemblages are defined by a new development of the Levallois

technique; the apparition of bifacial points, hand axes, and knives; and the apparition of a blade Levallois technique and of a blade prismatic technique, anticipating the rapid emergence of the transition industries during the second part of the OIS 3.

Raw Material Procurement and Middle Paleolithic Assemblage Variability

The researches of the outcrops of raw material for Paleolithic sites have been multiplied since the last 20 years. There is globally a main opposition between Middle Paleolithic and Upper Paleolithic raw material procurement for lithic industry. The Upper Paleolithic raw material is quite totally flint, while Middle Paleolithic raw material has been made from various stone materials including local flint.

For example, in the Armorican Massif (western France), the raw material list includes flint, various sandstone, dolerite, phtanite, quartz, and tuff (Monnier 1991). In Liguria (Italy), Middle Paleolithic industries are using local quartzite, siliceous limestone, rhyolite, and jasper (Negrino and Starnini 2003). In central Europe, region where the flint is rare, the material used is quartzite, opal, jasper, radiolarite, and porphyry.

Recent studies are confirming that the procurement distance for Middle Paleolithic sites is less than about 20 km or equivalent to a day walking (Feblot-Augustins 1997), revealing the weak mobility of Middle Paleolithic groups. Nevertheless, the sample of Middle Paleolithic sites concerned by such a synthesis is mainly western and central Europe sites dated from OIS 4 and few from OIS 6 pleniglacial periods. We have quite no information concerning OIS 5 Middle Paleolithic sites.

The difference in the quality of the raw material explains a correlation between raw material quality and tool type. For example, in the Middle Paleolithic site of Karreg-ar-Yellan (Brittany, France), side scrapers, points, and hand axes are made for 65% with flint and 35% with microgranite; notches and denticulate and other retouched flakes are made for 65% with microgranite and 35% with flint (Huet et al. 2003). Such a variability is enough to create the first factorial axis opposing side scrapers to notches/denticulate in the PCA discussed before (§ 3). Generalizing such examples, it is possible to conclude that the variability of the ratio "side scraper/notches + denticulate" may be associated with the raw material variability and no longer with culture (Bordes), function (Binford), or chronology (Mellars).

The European Middle Paleolithic to Upper Paleolithic Transition and the Early Upper Paleolithic

Several important changes have been recorded during the isotopic stage 3:

- An important change of the Mousterian assemblages as defined previously: the Mousterian of Acheulean tradition in western Europe, the Micoquian industries in central and eastern Europe, the Levallois blade technology industries like the Bohunician (Oliva 1984) in central Europe and the Kremenician (Stepanchuk and Cohen 2000–2001) in eastern Europe.
- And then, after 40,000 BP, the apparition of the so-called "transition" industries, some of them correlated with the reoccupation of the central and northern European territories: southern Italy (Uluzzian), western Europe (Chatelperronian), central Europe (Szeletian), eastern Europe (Streletian, Gorotsovian), southeastern Europe (Bacho-Kirian), west-northern Europe (Lincombian), northern Europe (Jerzmanowician), and east-northern Europe (Ouralian). At the same time, in the upper Danube basin and along the western Mediterranean coast, the first stage of the Aurignacian industry (Very Early Aurignacian) is emerging. But simultaneously, in the southern Iberia and in Crimea, the late presence of Middle Paleolithic assemblages is actually showing no process of transition until a Late Aurignacian.

During the isotopic stage 4, the glacial climate reduced the peopled areas to southern and middle Europe through closed areas, increasing

endogamous reproduction, at the origins of the accentuation of the west European Neanderthal morphocranial features. During the isotopic stage 3, Europe is opening again, helping the repopulation of middle and northern Europe, and then crossing populations and accentuating the mobility of the human groups. At the beginning of the isotopic stage 2, from 34,000 BP, the climatic variability is announcing after a succession of oscillations, the progressive come back of the pleniglacial climate. Between 34,000 and 21,000 BP, all Europe is seeing a process of standardization of the lithic industries at the origin of a blade and bladelet Upper Paleolithic industry starting with the Early Aurignacian and finishing with the Late Gravettian, balanced by the progressive closing of the European space.

The Territory Management During Late Middle Paleolithic and Early Upper Paleolithic

For Middle Paleolithic sites, the distance of raw material procurement from the site of about 20 km defines the size of the territory of traveling of an Middle Paleolithic human group (1000 km^2) and then their food resource management. When the food resources, mainly herbivores (aurochs, bison, horse, deer, reindeer, ibex, etc.), are being exhausted by hunting, the group is obliged to leave its dwelling and to move elsewhere. Such a type of territory resource management is called "Local Opportunist Strategy" (Djindjian 2009a).

During the stage of polymorphic diversification of the "transition" industries (Djindjian et al. 1999), the actual data are showing a progressive change in the territory resource management, from a "Local Opportunist Strategy" towards a "Restricted Planed Strategy" with territories growing until 10,000 km^2 and more (Djindjian 2009a). This is then the emergence of the territory in the sociology of the hunter-gatherer groups.

A major change occurred with the Early Upper Paleolithic, the stage I (Early) of the Aurignacian after 34,000 BP. The procurement of flint, often at long distances (several hundred kilometers) depending of the availability of outcrops of good flint in the territory (and also sea or fossil shells); the specialization in the hunting of herbivores; and the spatial organization of seasonal dwellings are argumenting the evidence of a large territory until 100,000 km^2, where the groups are circulating in and meeting altogether. Such a type of territory resource management is called "Extensive Planed Strategy" (Djindjian 2009a).

The "Extensive Planed Strategy" is known in the European Upper Paleolithic with Aurignacian, Gravettian, and Magdalenian, corresponding to large territories, with high mobility of human groups and consequently a general uniformity of the material culture. In a recent paper (Djindjian 2009a), we have defined several types of territory resource management in association with the main European cultural facies:

Middle Paleolithic industries	"Local Opportunist Strategy"
Transition industry	"Local Opportunist to Restricted Planed Strategy"
Aurignacian	"Extended Planned Strategy"
Pavlovian	"Semisedentary Strategy"
Gravettian	"Extended Planned Strategy"
Lower Solutrean	"Local Opportunist Strategy"
Upper Solutrean	"Summer Mobility Strategy"
Early Badegoulian	"Local Opportunist Strategy"
Late Badegoulian	"Summer Mobility Strategy"
Sagvarian	"Summer Mobility Strategy"
Steppe zone Industries	"Summer Mobility Strategy"
Magdalenian	"Extended Planned Strategy"
Mezinian	"Semisedentary Strategy"
Southern Epigravettian	"Restricted Planed Strategy"
Epipaleolithic	"Restricted Planed Strategy"

The identification of a territory management strategy is a new approach in Paleolithic studies, based on the superposition of the circulation of groups due to raw material procurement, food resource management, and seasonal site locations, registrated in the annual cycle. If the data are now more and more available to identify the Upper Paleolithic strategies, it is not the case for Middle Paleolithic strategies where the researches have started since very few years. With better dated Middle Paleolithic sites, it would then be possible to confirm the evidence of a "Local Opportunist

Strategy" for OIS 4 Middle Paleolithic sites and to look at, as expected here as a consequence of our model, different strategies for Middle Paleolithic sites in the OIS 5.

The Material Culture Contradictions of the Standard Model

The change of the material culture of the Lower and Middle Paleolithic is generally studied as a general technological evolution model of stone knapping (Leroi-Gourhan 1964–1965) based on progressive efficiency in producing more numerous blanks to make tools. Recent data have supported contradictions to this model.

The first apparent contradiction is the evidence of blade and bladelet core technology in the Middle Paleolithic industries at various times, from OIS 7 to OIS 3.

The first blade technology in an Middle Paleolithic industry is the well-known Tabun D type, in the Levant, dated essentially from OIS 7 to 8 between 260,000 and 180,000 BP. No human remains are associated with such an industry (Bar-Yosef and Kuhn 1999; Bar-Yosef and Meignen 2001). Blade industries are also appearing in northwestern Europe during OIS 7–8 (Saint-Valery-sur-Somme).

During OIS 5, blade industries are now well known all over Europe: France, Belgium, Rhineland, and Poland (Tuffreau and Révillon 1994; see also the workshop of 6–7 April 2006 in Bordeaux ("The laminar phenomena during Middle and Upper Palaeolithic in Eurasia"): Riencourt les Bapaume, Seclin, Bettencourt Saint-Ouen, Rocourt, Vanne river in Yonne region, Bergeracois, etc.).

At the beginning of OIS 3, the development of a Levallois technique may be adapted to a production of blades and bladelets, associated sometimes with a blade and bladelet prismatic core production. In the Levant (Boeda and Bonilauri 2006; Pastoors et al. 2008; Otte and Kozlowski 2009), after the OIS 4 Tabun B Middle Paleolithic industry, are known industries showing a strong dynamic of technical innovations: a mix of Levallois technology and blade prismatic technology or bladelet knapping on Levallois technology. A similar process appears in eastern and central Europe with the development of Levallois laminar technology: Bohunician and Kremenician, participating to the reoccupation of the middle and northern Europe. Alternative technologies using bifacial points and bifacial knives are also participating to the same process (MTA, Micoquian), reinventing the features of the multi-use portable hand axe of the Acheulean (see below).

Another interesting example is the lower Rhone basin where a local industry around 40,000 BP, the Neronian, is characterized by the production of blades and bladelets, and the development of microliths made on a good quality flint procured at a distance more than 100 km. The Neronian is superposed by a Late Mousterian and then by a Very Early Aurignacian (Slimak 2008).

The second apparent contradiction is the comeback of a flake core industry made on various raw material procurement during Upper Paleolithic, at the time of the maximum ice age in the periods called Lower Solutrean and Early Badegoulian in western Europe. It is interesting to point out here the archaic features of the Lower Solutrean industry which are at the origins of a hypothesis about the origins of the Solutrean directly from a Very Late Mousterian in the lower Rhone basin (Smith 1966). It is also interesting to remember the Badegoulian has often been considered as the "ugly" Upper Paleolithic industry, coming just after the Upper Solutrean leaf points, considered as the Upper Paleolithic "most esthetic" industry (Bordes 1968). The real reason of such a change is the withdrawal of the territories of the middle Europe by the Gravettian groups when the climate is at the maximum ice age around 21,000 BP. Going down to the southern Europe, the groups have lost all the knowledge about flint raw material outcrops and specialized herbivore hunting and have been obliged to regress to a "Local Opportunist Strategy" and various bad quality raw material procurement like the Mousterian during OIS 4 but with a long tradition of blade prismatic core technology they have not forgotten. When the climate has changed towards

a more humid but always very cold period first between 20,000 and 19,000 BP (Upper Solutrean) and second between 18,000 and 16,500 BP (Late Badegoulian), then the groups have moved towards a "Summer Mobility Strategy" which allows them to circulate to the north, during the summer, to exploit again the good flint outcrops and the resource of the migrating herbivores (reindeer). It is the case in western Europe (Upper Solutrean, Late Badegoulian), in central Europe (Sagvarian, Epigravettian), and in eastern Europe (walking up the Dniester, the Dnepr, and the Don valleys).

A Mobility Process Is Explaining Also the Material Culture Variability

We are introducing here an explaining variable, the mobility, which is playing a major role in the process of adaptation of the human groups with their environment, at a given time, in a given physical geography and under a given climate. The mobility of the human groups is associated with the size of a territory in which the network of the human groups is circulating and meeting altogether, during the annual cycle and with their food resource management strategy, as those we have defined above.

The mobility process is involving all the technical, organizational, and social solutions which may get easier the mobility of the human groups. At the level of the material culture, they concern mainly the toolkit and the dwelling architecture.

The toolkit needs to be easily portable. The technical solution of the blade and bladelet prismatic core allows producing standardized and numerous blanks more easily than an Middle Paleolithic flake core. The invention of the blade and bladelet production is due to a functional need and not to the evolutionist model proposed by A. Leroi-Gourhan (1964–1965). It is because the invention has already been made before (OIS 5 and 7) for certainly the same reasons and because a regression has also occurred during the Upper Paleolithic at the maximum ice age of OIS 2.

The spatial distribution of the tool manufacturing process is very different between the Middle Paleolithic and Upper Paleolithic industries. In the Middle Paleolithic industries of OIS 4, the raw material origin is very near from the permanent dwelling, and all the products of the core reduction sequence are generally found inside the site. In the Upper Paleolithic industries of OIS 2, where the raw material outcrops are often very far from the site (until several hundred kilometers), the cores are prepared directly at the outcrop, they may be stored in a cave or rockshelter bivouac easy to be found again, and they are carried by hunters who can produce blanks when they need it during the travel or in a seasonal site, until complete exhaustion.

It could be untimely to suggest some kind of analogous process for Acheulean during the temperate period OIS 12 to 9, with the hand axes. Such a portable artifact may be considered both as a multiuse tool for chopping and a core to produce flakes for cutting. Their comeback during the beginning of OIS 3 (MTA, Micoquian) may be considered as an alternative to blade solutions.

In conclusion, during the temperate periods, the increasing of the mobility of human groups has for consequences the long-distance circulations, the Extended Planned Strategies over large territories and portable tools. During the cold periods, the decreasing of the mobility of human groups has for consequences the short-distance circulations, the Local Opportunist Strategies over small territories and tools produced and used inside the permanent dwelling.

Then we may change the proposal of A. Leroi-Gourhan (1964–1965: 192, Fig. 64) who sees an optimization of the production (number) of blanks (cutting edge length for 1 kg of material) inside an evolutionist model, by an optimization of the lightness of the blanks inside an adaptation to the environment. Consequently, the technical evolution of the knapped stone industry, which is traditionally seen as a long cognitive process, must be revisited as a serendipity process. Such a conclusion is not so surprising when, by experience, it is easy to understand how to pass from a chopper or a chopping tool to a hand axe (by flaking all around the piece), from a hand axe to a Levallois flake (by knapping on the butt of the hand axe to obtain a Levallois flake), from a Levallois core to a prismatic core (by pivoting 90° the core and using the lateral edge as a crest blade), from a Quina side scraper to a bladelet prismatic core, etc. Then, the

invention of the blade or bladelet prismatic core may be seen not as a technical revolution but just as an invented and reinvented technical potential for a functional need.

The Emergence of "Art"

The evolutionist theory of Paleolithic art proposed by A. Leroi-Gourhan (1965) has been refuted by the recent discoveries of caves and radiocarbon dates made on progressive more numerous paintedly figures. It appears that cave art, like portable art, emerged very quickly with the beginning of Aurignacian (Early or phase I) around 34,000 BP (for a detailed discussion of data, see Djindjian 2004a). There is actually no evidence of animal figurative or schematic representations in the previous period during the "transition industries" or with the Very Early Aurignacian (phase 0), but only few ornament objects (if they are not coming from an upper Aurignacian layer like in the case of the reindeer cave in Arcy-sur-Cure).

When it emerged in the Early Aurignacian, the technical control of the animal figurative representations seems to have been immediate both in cave art like in the Chauvet cave in the Rhone basin and in the portable art like in the Geissenklosterle rockshelter in the upper Danube basin. This means that the emergence of this so-called art was not a cognitive question but an invention corresponding to the need for a function (to be discovered) inside the human group.

A new explanation for the variability of animal species figurations in the both cave and portable art has been recently proposed (Djindjian 2004b, 2009b). It is based on a correlation, at the scale of territory, between the regional mammal zoocenoses, the bone taphocenoses of the Paleolithic campsites, and the cave iconocenoses (bestiaries). The conclusions of the studies are revealing several types of bestiaries for each period (Aurignacian/Gravettian, Solutrean/Badegoulian, and Magdalenian). A type of bestiary is identifying a territory, and the cave is a symbolized representation of the territory through the zoocenoses living in. The caves, often located in the frontiers of the territory, are marking the territory of the hunter groups. The animal representations in the cave and portable Paleolithic art have then a function associated with the territory of the network of human groups, marking and symbolizing their territory.

It is certainly the reason for which there is no portable and cave art in the European MP, because there is no defined territory associated with a "Local Opportunist Strategy." The MP groups are leaving their dwellings when they have exhausted the food resource of their small 1000 km^2 area and they are searching for a new location elsewhere. The links between groups are then much weaker and the meeting of two groups is more randomly than planned. The difference between Middle Paleolithic and Upper Paleolithic systems is then also a difference of social organization.

Change of System or Change of Peopling?

The argumentation we have developed previously has concluded that the material culture change between Middle Paleolithic and Upper Paleolithic industries may be explained by mobility changes associated with different territory management and social organization of the human group network.

Consequently, it is not possible to use those differences as arguments to conclude that Middle Paleolithic industries are made by Neanderthals and Upper Paleolithic industries by modern men. We also point out that in Middle East, both Neanderthals and modern humans are responsible for making Middle Paleolithic industries. It is also the case in Africa, where modern humans are making Middle Paleolithic industries (Middle Stone Age, Aterian).

Results of genetic studies are more confusing. A difference of 99.5–99.9% between the genome of Neanderthals and modern humans has been published argumenting the absence of interbreeding aptitude, and then they are contributing to the hypothesis of the arrival of modern men and the extinction of Neanderthals (Krings et al. 1997). But more recent studies are informing us there is a common genetic stock of 1–4% between the two genomes (Green et al. 2009). It involves a greater complexity of the anthropological model where

the replacement hypothesis could be challenged by an interbreeding hypothesis including or not a local evolution model, in which the role of the archaic features is much more emphasized.

But the definitive arguments for elaborating the models may only be based in the discovery of sufficient human bone remains in reliable stratigraphic sequences and associated with industries. Such data are lacking today in Aurignacian sites (Churchill and Smith 2000; Henry-Gambier 2002). Either we have very few bone remains, difficult to attribute definitively to the modern man, or we have intrusive bones into the Aurignacian layers like in Vogelherd (Conard et al. 2004), Velika Pecina (Smith et al. 1999), Hahnöfersand 1, and Zlaty Kun (most of them have played an important role in the thesis of the arrival of the modern man), or owning to uppermost Gravettian layers like in Cro-Magnon (Djindjian et al. 1999; Henry-Gambier 2002), or we have unquestionable modern man bone remains but in a questionable stratigraphic context like in Mladec (Wild et al. 2005; Teschler-Nicola 2006) or we have radiocarbon dated bone remains but without archaeological context like in the cave bear of Pestera cu Oase in Romania (Trinkaus et al. 2003). The human remains coming from Late Aurignacian remains (e.g., Les Rois or La Crouzade), considered as modern men, are nevertheless indicating that around 30,000 BP, the process of modernization (whatever the model) is progressing rapidly. Perhaps, such a position would be considered too pessimistic. Looking at the last inventory of human remains in an Aurignacian context, favorable to the hypothesis of the replacement of Neanderthal by the modern man (Hublin 2010, in Otte), it is always not totally convincing they are proving such hypothesis, due to a lack of definitive evidence like that given by an adult burial found in a Aurignacian layer. The archaic features of various limited and often juvenile bone fragments, of which the interpretations are often different among the specialists, are always opening the way to alternative explanations.

Conclusions

The Middle Paleolithic to Upper Paleolithic transition in Europe may be interpreted as a change in the economic and social organization of groups of hunter-gatherers, independent of the actors involved by the transition. The key to understanding such a transition is a better knowledge of the Middle Paleolithic system at the same level of information we have actually for the Upper Paleolithic system: chronology, thin climatic changes, food resource management system, raw material procurement, and mobility in association with the material culture. We need also to make some methodological revolution in trying to think process and no longer to classify data, either through a morpho-typology like in the fifties or trough a techno-typology since the eighties. In archaeology, the research for origins somewhere or elsewhere is always like the "Tartar desert" syndrome. The discovery of a successful process does not need to find its initial "big bang" but only its significant effect.

Cross-References

- ▶ Central Asia: Paleolithic
- ▶ Crimean Late Middle Paleolithic to Early Upper Paleolithic Transition
- ▶ Crimean Middle Paleolithic
- ▶ Europe: Early Upper Paleolithic
- ▶ European Middle Paleolithic: Geography and Culture
- ▶ European Middle to Upper Paleolithic Transitional Industries: Châtelperronian
- ▶ Middle East Middle to Upper Paleolithic Transitional Industries
- ▶ Northern Europe: Middle to Upper Paleolithic Transition

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European Middle to Upper Paleolithic Transitional Industries: Châtelperronian

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State of Knowledge and Current Debates

About 45,000 years ago, anatomically modern humans migrated into Europe, and a few thousand years later Neanderthal populations had completely vanished from Europe. This replacement of the local populations by anatomically modern humans also happened in the rest of Eurasia. It explains why today we are the only human species on the planet when Hominin groups flourished for several million years.

The Châtelperronian industry (*Châtelperronien* or *Castelperronien* in French) is considered to be the very last behavioral testimony of Neanderthals in France and northern Spain. For a few millennia, Neanderthals switched to systematic blade production, focused on stone knives that could also be used as projectile points, and in some instances produced domestic bone tools and used black and red pigments as well as personal ornaments.

What appears to be a brief episode, compared to other Late Pleistocene industries, is indeed often considered as a Neanderthal *"swan song."* Châtelperronian behaviors are actually part of a more global industrial change and evolutionary trajectory. This global industrial change would have been driven by the search for stone-tipped weapons, and possibly correlated with new organic and lithic material procurement strategies as well as a new social network organization (Bon 2010). The model of a clear-cut revolution with the arrival of modern Humans in Europe (Mellars and Stringer 1989) was put forward in the mid-1980s. At that time, it was grounded on available data on Neanderthal behavior, which were a compilation of Neanderthal behavior over the Middle and the Late Pleistocene. During the last decade, new data on Neanderthal behavior during the last glacial cycle (including Neanderthals right before the peopling of Europe by modern humans) nuanced this model. In fact, almost every behavior previously thought to be unique to anatomically modern humans was shared, at least occasionally, by Neanderthals; image production on durable support is still one major difference (d'Errico 2003; Soressi 2005; Peresani et al. 2011). The Châtelperronian no longer appears as an *"avatar of a dying middle Paleolithic but [indeed] as the first machinery of an Upper Paleolithic to become"* (Bon 2010: 139).

Because the Châtelperronian is in a stratigraphic position at the crossroads of the Middle and Upper Paleolithic, because it is of Upper Paleolithic type, and because only Neanderthal

remains were discovered associated with it, the Châtelperronian is often called a "transitional industry." Even if Mousterian "souvenirs" had been actively searched within Châtelperronian industries, they are almost nonexistent (see below). It is indeed clear that the Châtelperronian is neither an intermediate between the Middle and the Upper Paleolithic nor a mix of Middle and Upper Paleolithic behaviors. On the contrary, it is a unique set of behaviors that shares commonalities with contemporaneous industries.

It is interesting to note that the use of contemporary ideological construction is sometimes pleaded for (e.g., Zilhão et al. 2008) to contest interpretative models of the Middle to Upper Paleolithic transition. This passion is also visible in popular science movies and journals, and certainly illustrates how much Paleolithic archaeology can be a popular topic grounded on an ongoing debate. This entry aims to summarize the current state of understanding on a highly debated topic: the nature and significance of the Châtelperronian.

The Recognition and the History of the Châtelperronian

The Châtelperronian was originally defined by H. Breuil after the lithic industry found at the cave of fairies ("la grotte des Fées") in Châtelperron, a small village in central France. This industry contained a specific blade and point with a back shaped with abrupt retouches, the back of the point type being curved. Breuil emphasized the similarities between the Châtelperronian and the Abri Audi type industry, later attributed to the Mousterian of Acheulean Tradition (MTA), especially the high frequency of backed blades and poorness of bone tools. For Breuil, the Châtelperronian as well as the Mousterian of Acheulean Tradition were the first stage of the Upper Paleolithic. At the time, the Upper Paleolithic was divided into "Lower Aurignacian" (MTA and Châtelperronian), "Middle Aurignacian" (the actual early Aurignacian), and "Upper Aurignacian" (the actual Gravettian); these were all clustered within pre-Solutrean sites (Breuil 1909–1911).

Twenty-five years later, D. Peyrony put the emphasis on what he called the Perigordian complex (*Périgordien complex* in French). He suggested that the Châtelperronian and the Gravettian were part of the same phylum, as they shared an emphasis on backed pieces with abrupt retouches. The "Middle Aurignacian" would be indeed intrusive in southwestern France and would have developed there, while the Perigordian would have found refuge in remote places and would be indeed only exceptionally visible in the archaeological record (Peyrony 1936).

With the start of the second half of the twentieth century, Peyrony's theory and the Perigordian phylum started to be disputed, first by H. Delporte. From his excavation and study of Châtelperron and La Gravette, Delporte advocated that these industries are not genetically related and should be named Châtelperronian and Gravettian (Delporte 1954). D. Sonneville-Bordes argued that the second stage of the Perigordian complex, the "Périgordien II," results from mixing the Aurignacian with some intrusive backed pieces (Sonneville-Bordes 1955). However, Sonneville-Bordes as well as others (including F. Bordes and L. Pradel), were convinced of the evolutionary link between what they renamed the Lower Perigordian (equivalent of the former Perigordian I, i.e., the Châtelperronian) and the Upper Perigordian (actual Gravettian). They used the interstratification Châtelperronian and Aurignacian recognized in 1967 at Le Piage and Roc-de-Combe as evidence of contemporaneity of the two industries (see references to original publications in Bordes 2003). And, they indeed supported Peyrony's view that the Aurignacian episode was caused by the intrusion of a non-local group into the Perigordian territory.

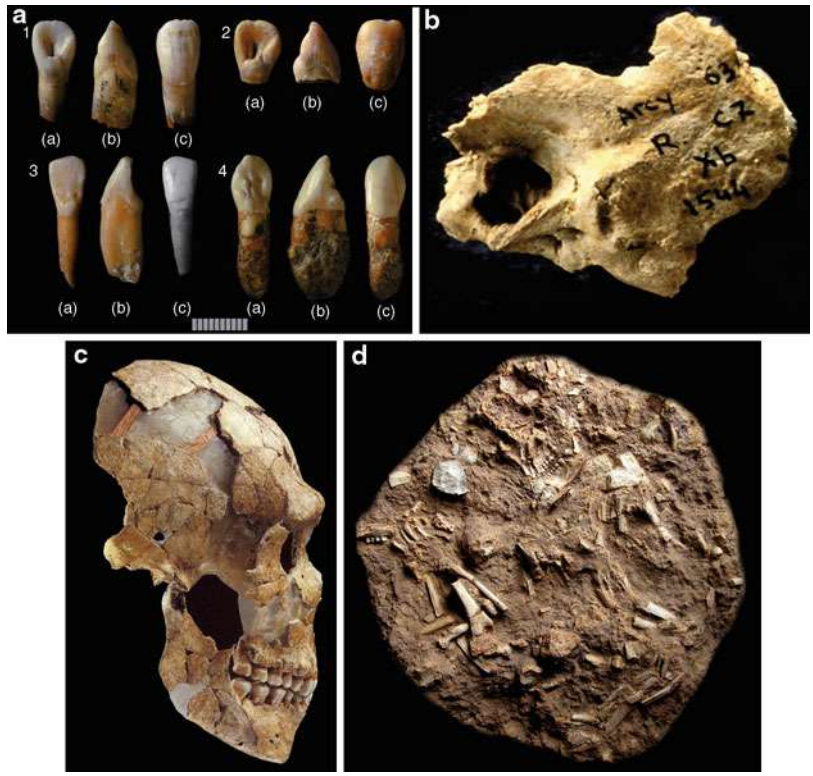
The debate went on through the 1960s but lost some of its interest during the following two decades. It eventually shifted towards the independence between the Châtelperronian and Gravettian when the first radiometric dates showed that the two industries were separated by about 10,000 years (Mellars et al. 1987). The interstratification between the Châtelperronian and Aurignacian were also shown to be not of anthropic origin and related to geological disturbance (Bordes 2003). Finally, another attempt to support potential interstratification (Gravina et al. 2005), or at least evidence for contemporaneity between the Aurignacian and Châtelperronian, was recently put forward but seems to suffer from insufficient demonstration (see Zilhão et al. 2008).

In fact, the major change of perspective on the Châtelperronian came at the end of the 1970s and was caused by the unexpected discovery of Neanderthal remains, and noticeably an almost complete skeleton, in a Châtelperronian context (Lévêque and Vandermeersch 1980). The Gravettian, Aurignacian, and Châtelperronian were not only technically different industries but were also generated by two biologically different human populations. The equation between the Middle Paleolithic type industry and Neanderthals, or Upper Paleolithic type industry and anatomically modern humans, then started to be questioned in Europe, as it had already been questioned in the Near East.

The Makers of the Châtelperronian

Châtelperronian human remains (some of which are illustrated in Fig. 1) are overwhelmingly more abundant than human remains found in the late Mousterian or in early phases of the Aurignacian. There are 29 isolated teeth, one temporal bone, and other fragmentary remains in the Châtelperronian from Grotte du Renne at Arcy-sur-Cure. All the teeth but one were assigned to the reference Neanderthal group with posterior probabilities ranging from 59% to 99.9% (Bailey and Hublin 2006). The morphology of the Grotte du Renne inner ear preserved in the temporal bone is typical of Neanderthal morphology (Hublin et al. 1996). Châtelperronian human remains also include one nearly complete skeleton and some extra isolated teeth found at Saint-Césaire (Lévêque and Vandermeersch 1980). Taxonomic attribution for the Saint-Césaire skeleton has been confirmed by several authors, and the Saint-Césaire isolated teeth also display a Neanderthal morphological pattern (Bailey and Hublin 2006). By comparison, the number and quality of human remains attributed to the Protoaurignacian are much lower, only some fetal remains and one deciduous tooth, and none of them are diagnostic (Hublin in press).

Nevertheless, the view that the Châtelperronian was made by Neanderthals was recently challenged, primarily by questioning the stratigraphic integrity



European Middle to Upper Paleolithic Transitional Industries: Châtelperronian, Fig. 1 Châtelperronian human remains from Grotte du Renne at Arcy-sur-cure (**a**: teeth and **b**: temporal bone), and from Saint-Césaire (**c**: in-situ skeleton and **d**: close up of the skull of the skeleton after reconstruction) (After Bailey and Hublin 2006; Hublin et al. 1996; photo of the cast of the in-situ skeleton © Soressi)

of key sites, rather than discovering new human remains that would have directly challenged the Neanderthal signal for the Châtelperronian. It was suggested that Neanderthal remains found at the Grotte du Renne result from contamination from underlying Mousterian layers. This conclusion was reached thanks to the analysis of a series of ^{14}C AMS dates that were inconsistently variable in the Châtelperronian layer (Higham et al. 2010). However, 31 new ^{14}C measurements falsify the notion that large-scale movements of archeological material occurred between the Mousterian, Châtelperronian, and Proto-Aurignacian layers at the Grotte-du-Renne and questioned the sampling methodology in the first study (Hublin et al. 2012; see details below in the chronology section). Reworking of the Neanderthal remains from the underlying Mousterian layers is inconsistent with the fact that these Mousterian layers contained very few human remains, and last but not least Neanderthal remains were found throughout the four Châtelperronian layers at Grotte du Renne, not only the lowermost one (Hublin et al. 2012).

The Neanderthal nature of the makers of the Châtelperronian was also indirectly challenged by criticizing the local origin of the Châtelperronian. If the origin of the Châtelperronian is not within the local Mousterian of Acheulean Tradition type B, as put forward first by H. Breuil (1909–11), it opens the door for a non-Neanderthal origin. This hypothesis is also intriguing inasmuch as anatomically modern human remains had been recently published in another so-called "transitional" industry: the Uluzzian from Italy (Benazzi et al. 2011). Yet, arguments for a local Mousterian of Acheulean Tradition origin for the Châtelperronian are as follows:

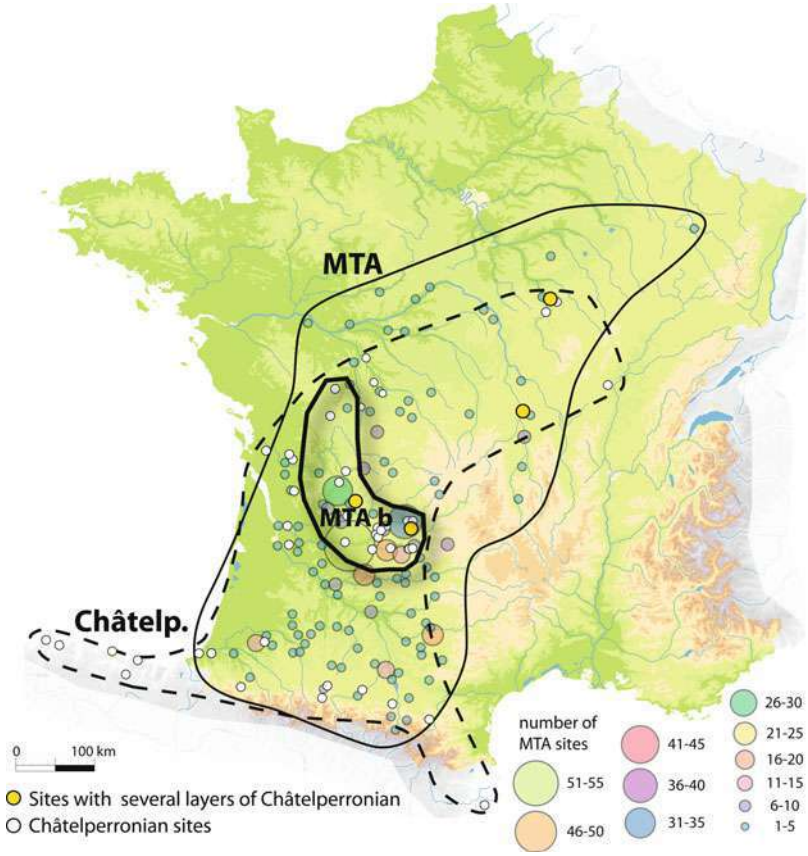
1. The Mousterian of Acheulean Tradition and the Châtelperronian share a unique interest for backing tools and for unretouched backed blanks,
2. They also share a unique combination of elongated and backed blanks or retouched tools, which does not exist in any other contemporaneous industry,
3. The necessity to obtain backed artifacts (retouched and unretouched) is actually guiding the production of Mousterian of Acheulean Tradition elongated flakes (Pelegrin and Soressi 2007; Soressi 2005) as well as the production of Châtelperronian blades (Roussel 2011 and in press). Backed elongated flakes and backed blades (i.e. with an asymmetrical transversal section) are obtained directly during the production. The method used to produce blanks within the two industries is relying on the obtainment of a high quantity of backed blanks, some of which will be retouched. Some extra backed artifacts, retouched backed knifes and châtelperron points, are obtained through a-posteriori retouch of blanks symmetric in section.
4. Geographic distribution of the Châtelperronian matches outstandingly that of the Mousterian of Acheulean Tradition (Fig. 2), and they are chronologically compatible (Soressi 2005).

Geographic Distribution

The Châtelperronian point or knife is quite distinctive from other Paleolithic retouched artifacts and allows for a quite easy diagnosis of Châtelperronian sites (Pelegrin and Soressi 2007). The map of Châtelperronian sites is indeed reliable. In contrast to other industries of the Middle or Upper Paleolithic, the geographic distribution of Châtelperronian sites is relatively small (Fig. 3). A little more than 40 sites have been recognized on an arch about 300 km wide, which fits closely the west half of the Massif Central. They are found from Burgundy, with the famous site Grotte du Renne at Arcy-sur-Cure, extending through the Dordogne Valley, down to Cantabria, with Cueva Morin, and the Oriental Pyrenees with Le Portel (Fig. 3). No Châtelperronian sites were found in the Rhone valley, in southeastern France, or in northeastern France, in the heart of the Parisian basin or in Brittany.

Dating

The Châtelperronian is always interstratified between Mousterian and Aurignacian layers (see details about putative stratification Châtelperronian/Aurignacian/Châtelperronian above). If this stratigraphic position is clear, precise dating of



European Middle to Upper Paleolithic Transitional Industries: Châtelperronian, Fig. 2 Map of the distribution of the Mousterian of Acheulean Tradition (MTA; *bolded line*), the Mousterian of Acheulean Tradition type b (*shaded line*) and the Châtelperronian (*dotted line*)

the Châtelperronian with radiometric methods is nonetheless difficult. The ^{14}C method is at the edge of its time range, and the radiocarbon community agreed only recently on a calibration curve for the time range covered by the Châtelperronian. Specific methods were recently developed to cope with the very low percentage of carbon 14 contained in such old samples as well as with contamination issues (Higham et al. 2010; Hublin et al. 2012).

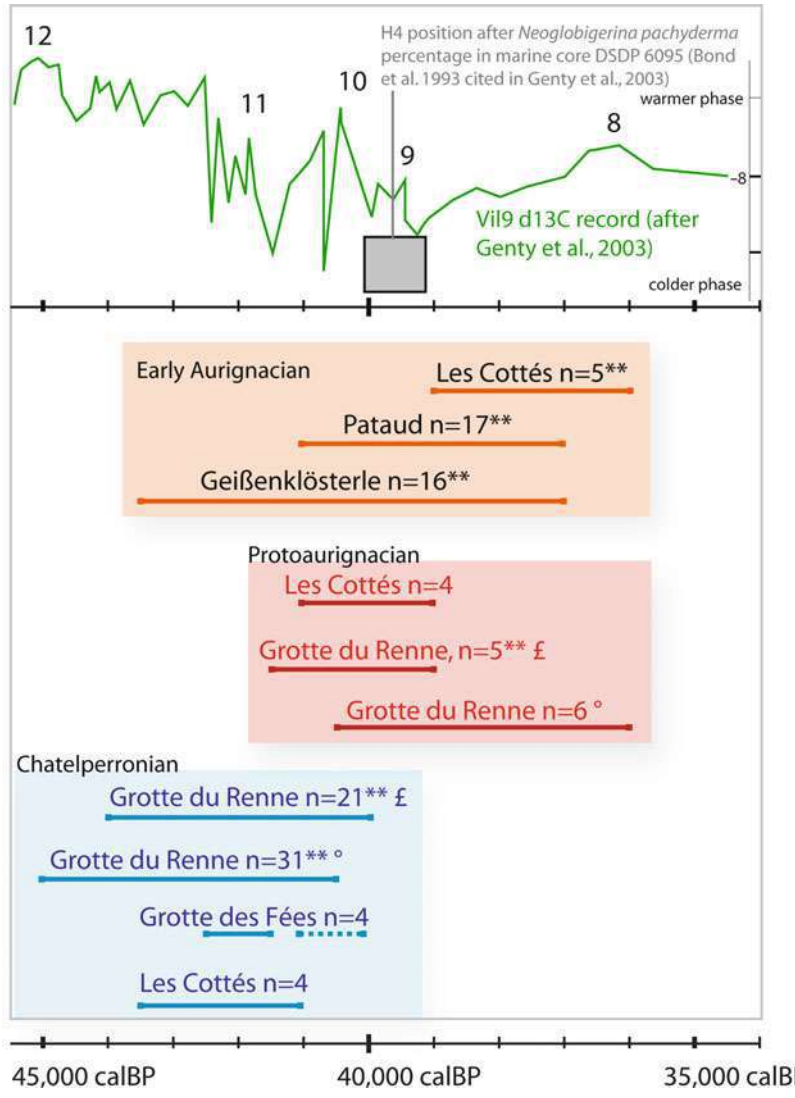
How to properly date Châtelperronian samples is intensely debated, as illustrated by a series of papers published on the Grotte du Renne deposits. First, 31 accelerator mass spectrometry (AMS) ultrafiltrated dates on bones, antlers, bone artifacts, and teeth indicated that the Châtelperronian from Grotte du Renne was 44 to 40,000 years old (cal. BP). The high degree of intralayer variation in the radiometric dates obtained was used by the authors to support admixture between the Châtelperronian, Mousterian, and Protoaurignacian (Higham et al. 2010). It is interesting to note that this latter conclusion was put forward assuming that enough progress has been made within ^{14}C dating to make it totally reliable and to become a piece of data supporting site integrity on its own. This former conclusion was first contested and discussed in a series of papers that showed that there were several arguments grounded on the study of the archaeological material to show that there was no major mixing between layers at the Grotte du Renne. Also, 35 new measurements were recently performed with a different sampling strategy aiming at the acquisition of well-preserved collagen, by selecting bigger and thicker samples of cortical bone (Hublin et al. 2012). These have shown that:

European Middle to Upper Paleolithic Transitional Industries: Châtelperronian, Fig. 3 Map of Châtelperronian sites (sites with several layers of Châtelperronian are indicated in *yellow*) (modified from Pelegrin and Soressi 2007 and from Roussel 2011)

1. younger ages obtained by the first study were certainly related to a low collagen content
2. no mixing could be deduced from new AMS ^{14}C measurements done on bone with high percentage of collagen content,
3. the age of the Châtelperronian at the site fits between 45,000 and 40,500 years cal. BP with a 2 sigma range. This fits with other ages obtained at other sites with the same method (Fig. 4).

Characteristics of the Châtelperronian Lithic Industry

The first extensive study of Châtelperronian lithic industries was done by F. Harrold (1978), who studied 19 Châtelperronian assemblages from France and northern Spain (after having reviewed more than 100 potential Châtelperronian assemblages). Using Sonneville-Bordes and Perrot stone-tool type lists, Harrold highlighted the



European Middle to Upper Paleolithic Transitional Industries: Châtelperronian, Fig. 4 Two sigma intervals for ages obtained using AMS and ultrafiltrated ^{14}C samples and calculated using a Bayesian model of Châtelperronian and other western European contemporaneous Early Upper Paleolithic industries. Les Cottés: see Talamo et al. 2012; Grotte de Fées: see Gravina et al. 2005; Grotte du Renne: see Higham et al. 2010; Hublin et al. 2012; Pataud: see Higham et al. 2011 cited in Higham et al. 2012; Geißenklösterle: see Higham et al. 2012. The number of samples is indicated. ** indicates that more than one level was studied. D13C record from the Villars stalagmite indicates a probable warm short event as recorded on the continent in the north of the Aquitaine basin (see Genty et al. 2003). The position of the Heinrich event 4 is also indicated after Bond et al. 1993, cited in Genty et al. (2003)

recurrent features of the Châtelperronian. He showed that the Châtelperron points/knives are typical of the Châtelperronian, and they count for up to 60% of the typological count. Châtelperron points or knives go with end-scrapers and burins. The typological spectra of these Châtelperronian assemblages allowed Harrold to conclude that the Châtelperronian is a *"distinct lithic tradition of the earliest Upper Palaeolithic"* (Harrold 1978: 435).

A new approach to the Châtelperronian lithic industry was brought in by J. Pelegrin in the mid-1980s (Pelegrin 1995). From his analysis of cores, stone-tools, and by- and end-products found at two Châtelperronian sites in southwestern France (Roc-de-Combe and La Côte), he provided the first description of the Châtelperronian "*chaîne opératoire*." For a long time, his study was in fact one of the rare detailed *chaîne opératoire* analyses available for the Late Pleistocene. Pelegrin showed that Châtelperronian cores are aimed toward the production of rectilinear blades, and that they are organized with a narrow and wide surface, the narrow surface being a maintenance surface. Blades obtained on the wide surface and with regular edges are selected to be retouched into Châtelperron knives or points. Larger and thicker blades are retouched into end-scrapers, burins, or retouched blades. End-scrapers are also made out of flakes produced during the shaping of the core.

From a detailed analysis of blade platforms, Pelegrin argued for the use of a soft hammer or a soft stone hammer during Châtelperronian blade production (Pelegrin 1995: 252). Scarce bladelet production was observed in both sites, but without any evidence of retouched bladelets.

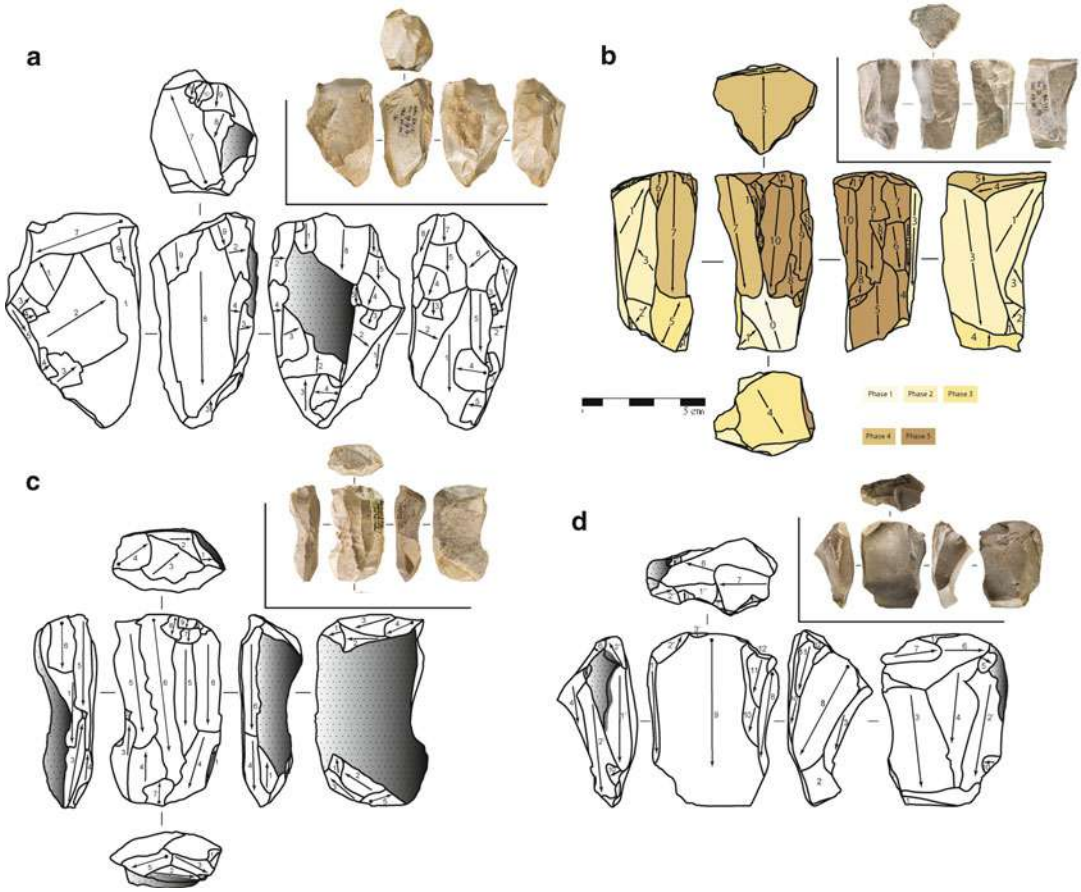
Pelegrin argued that Châtelperronian lithic production is specific and shows strong differences from that of the Early Aurignacian. He indeed concluded that differences between Châtelperronian and early Aurignacian debitage did not support the hypothesis of an acculturation of the last Neanderthals by the first anatomically modern Humans (d'Errico et al. 1998). However, Pelegrin actually brought new data supporting a link between the Mousterian of Acheulean Tradition type B and the Châtelperronian. From his analysis of two MTA B assemblages, he showed that the MTA B and the Châtelperronian shared an emphasis on backed pieces made on elongated flakes or blades. This was later one confirmed by extensive analysis of several other MTA B assemblages (Soressi 2005). Pelegrin main point was that this peculiar retouched tool should be linked to a specific kind of hafting, and indeed reflects a similar technical answer to comparable needs (Pelegrin 1995; Pelegrin and Soressi 2007).

Building on Pelegrin's pioneering work, a detailed analysis of the Grotte du Renne at Arcy-sur-Cure began. The totality of this abundant collection was studied by N. Connet (2002). She refined the understanding of variations through time and showed an increasing use of flint relative to other raw materials, coupled with an increasing use of blades. Backed pieces are more elongated and less curved toward the top of the sequence. Connet (2002) also insisted on the fully "Upper Palaeolithic character" of the Châtelperronian from the Grotte du Renne. There is no elaborated flake production at Grotte du Renne, as already seen in other Châtelperronian assemblages by Pelegrin (1995), and recently confirmed by Roussel (2011) and Bachellerie (2011).

The first use-wear analysis of Châtelperronian points/knives from Grotte du Renne showed that they were used as knives and also certainly as projectile tips (Plisson and Schmider 1990).

A more refined description of Châtelperronian blade production, as well as a precise first description of the bladelet production, was recently done from first-hand analysis of three Châtelperronian layers from Quinçay (Roussel and Soressi 2010; Roussel 2011). At Quinçay, the Châtelperronian sequence is sealed by a large roof fall and there is no other Upper Paleolithic layer documented in stratigraphy: contamination from more recent Upper Paleolithic industry is indeed improbable. The recent technological analysis showed that blades are removed by independent series on narrow and on wide surfaces of the core (Roussel in press). Each surface of a blade core is an independent flaking surface (Fig. 5). Blade cores show mainly a triangular section. Blades symmetrical in section as well as blades asymmetrical in section are produced. The latter are obtained at the intersection of two angular surfaces (Fig. 6). Châtelperronian blade production is qualified as a *"two step rhythm on an angular flaking surface."* Blades with strong metrical norm, noticeably minimum thickness and minimum width, as well as technical norm are selected for Châtelperron points/knives. The size of Châtelperronian points ranges between fixed minimum and maximum dimensions. This norm is constant throughout the sequence at Quinçay (Roussel and Soressi 2010; Roussel 2011) and appears to be similar to the one in southwestern France (Bachellerie 2011: 351–354). Quinçay analysis also suggests that semi-circular end-scrapers retouched on large cleaning flakes removed at the end of the blade production on blade core might be another type fossil for the Châtelperronian (Fig. 7: o and p). The blank seems to be specific to Châtelperronian blade production, as well as to the location of the retouch (Roussel 2011, in press).

Bladelet production is documented in the three Châtelperronian layers from Quinçay and follows a method similar to the one used for the blade production. However, bladelet cores are not reduced blade cores. Bladelet production is independent from blade production, and is done on already small blocks. Bladelets are long and slightly curved and are mainly retouched with marginal and inverse retouches on one edge only (Roussel 2011). Bladelet production would also be documented in southwestern France, but the rarity of retouched bladelets as well as potential

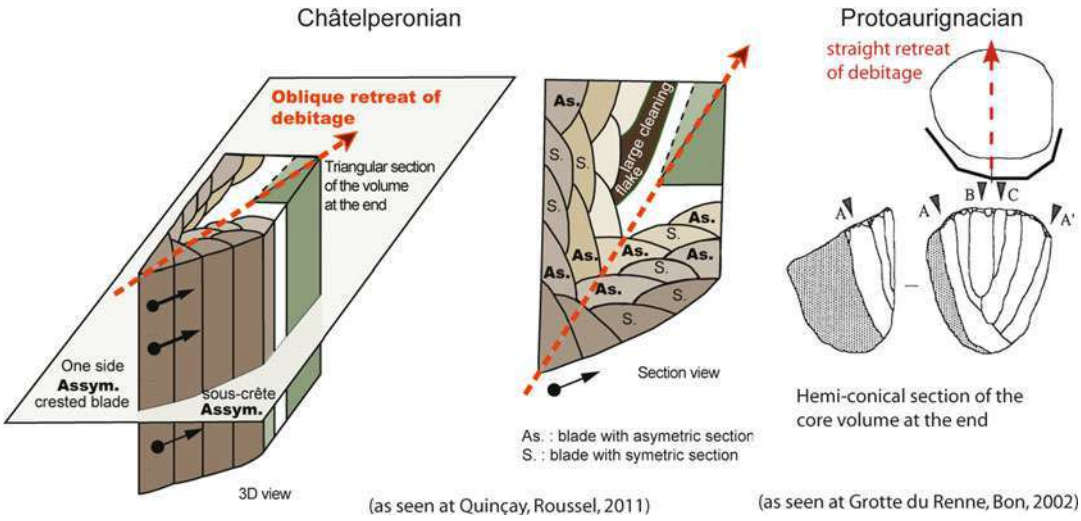


European Middle to Upper Paleolithic Transitional Industries: Châtelperronian, Fig. 5 Châtelperronian blade cores from Quinçay (After Roussel in press) abandoned at different stages. (**a**) Initialized core with a dissymmetrical volume, (**b**) Core exploited on two surfaces with a triangular section, (**c**) Core exploited on the wider surface with a testimony of a previously exploited narrow surface, on the right, (**d**) Core with a large cleaning flake on the wider surface

biases in assemblages excavated before the systematization of fine screening make it difficult to interpret (Bachellerie 2011: 367–368). Comparison with the Protoaurignacian production allows the suggestion of stimulus diffusion between Protoaurignacian and Châtelperronian groups (Roussel 2011; and see below).

Personal Ornaments, Bone-Tools, and Pigments in the Châtelperronian

Personal ornaments and bone-tools are rare within the Châtelperronian, but one site, Grotte du Renne, revealed a significant collection (Hublin et al. 1996; d'Errico et al. 1998, 2001; Carron et al. 2011; Fig. 8). About 40 personal ornaments were found at Grotte du Renne, and 6 pierced teeth were also found at Quinçay (Granger and Lévêque 1997). Some of the bone-tools from Grotte du Renne are decorated. At first, they were interpreted as resulting from exchange with Aurignacian groups because they show some similarities with personal ornaments discovered in the above Protoaurignacian layer (Hublin et al. 1996). Later, it was shown that bone tools manufacturing waste are present at the site during the Châtelperronian, which does not support the exchange hypothesis for the bone-tools (d'Errico et al. 2001). It was also shown that the highest number of bone-tools is



European Middle to Upper Paleolithic Transitional Industries: Châtelperronian, Fig. 6 Schematization of blade production in the Châtelperronian and in the Protoaurignacian (After Roussel in press)

found in the lower and richest Châtelperronian layer at the Grotte du Renne, and that they are found in areas that do not correspond to areas where the Aurignacian bone-tools are found in overlying deposits. Contamination from the above Aurignacian layers is indeed unlikely (d'Errico et al. 2001; Caron et al. 2011). Study of perforation techniques has shown that pressure or percussion techniques after thinning by scraping were preferentially used at Quinçay (Granger and Lévêque 1997). Meanwhile, percussion techniques seem more variable at Grotte du Renne and are similar to the perforation techniques used during the Aurignacian (White 2001).

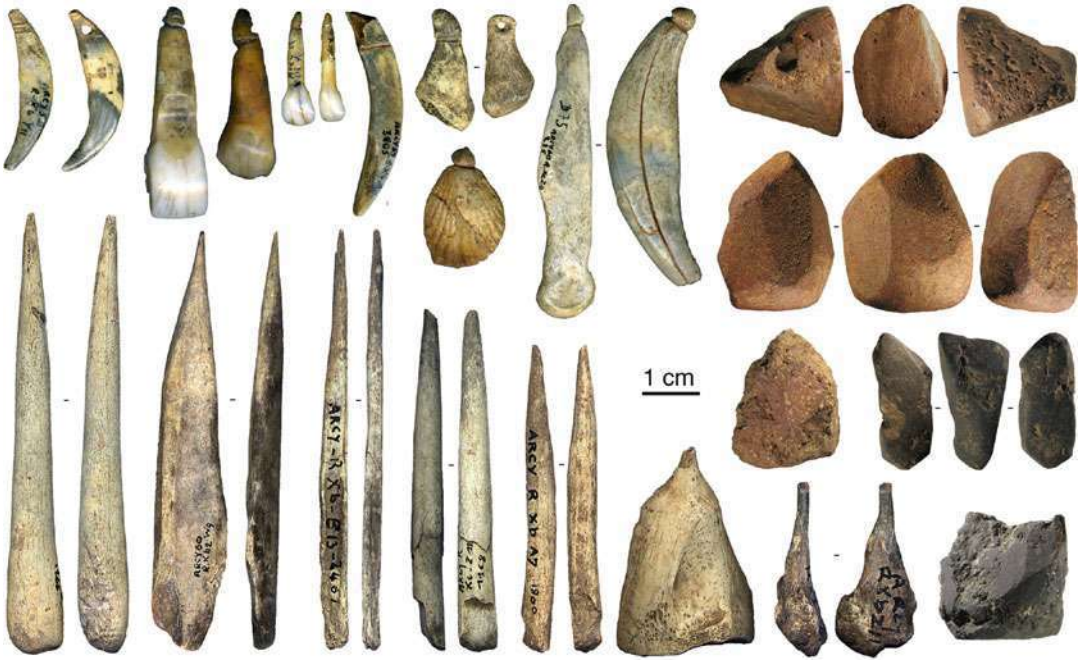
More than 20 kg of pigment, as well as pigment grinding tools, have been discovered at Grotte du Renne. Black and red pigments had been used (without heating), mostly as coarse powder to cover large surface areas, soils, or hides, and also as fine and highly coloring powder (Salomon 2009).

Contacts with Contemporaneous Groups

The existence of contacts between Châtelperronian and Aurignacian groups was intensely debated during the late 1990s. The lithic industry was quickly identified as being clearly different from the Aurignacian (Pelegrin 1995; d'Errico et al. 1998). Nonetheless, the fact that bone-tools and personal ornaments were not intrusive (d'Errico et al. 1998; Carron et al. 2011) seemed irreconcilable with the fact that some of them looked like the Aurignacian specimens and used techniques similar to the Aurignacian techniques (White 2001). Also, the development of these behaviors in indigenous groups when Aurignacian groups were entering Europe appeared to be an *"impossible coincidence"* (Mellars 2005).

The recent analysis of Quinçay bladelet production as well as a precise comparison of the blade production within the Protoaurignacian shed new light on the question of contacts. The method, as well as the goals, of the Châtelperronian blade production is clearly different from that of the Protoaurignacian. For the Protoaurignacian, the core volume is symmetric instead of being asymmetric in section, the flaking surface is large and integrates edges of the core, and the blade production is continuous all over the surface and is divided in series on each side of the core. The production rhythm is continuous on a large and curved surface and is in essence very different from the *"two step rhythm on an angular flaking surface."* Moreover, the Protoaurignacian blades do not show any asymmetrical section, and they are removed from a platform that is more oblique relatively to the debitage surface than the

European Middle to Upper Paleolithic Transitional Industries: Châtelperronian, Fig. 7 **a** to **l**: Châtelperronian knives/points; **m**: Audi type knife; **n** to **r**: semi-circular end-scrapers, including two (**o** and **p**) which were manufactured on a large cleaning flake extracted at the end of the blade production, and which might be another type fossil of the Châtelperronian. All artifacts are from Quinçay (After Roussel and Soressi 2010)



European Middle to Upper Paleolithic Transitional Industries: Châtelperronian, Fig. 8 Châtelperonian personal ornaments, bone-tools and pigments from La Grotte du Renne at Arcy-sur-Cure (Reproduced after Carron et al. 2011)

Châtelperronian one (Roussel 2011, in press). Bladelets are obtained following a method similar to the one used for blades in both industries; they are indeed different in the Châtelperronian and in the Protoaurignacian. However, the goal is similar: obtaining bladelets with marginal and inverse retouches on one edge, i.e., Dufour sub-type Dufour bladelets (Roussel 2011).

According to the theoretical model put forward by G. Tostevin (2007), sharing a common goal and using a different method of production can be interpreted as a testimony of the effects of stimulus diffusion. Stimulus diffusion implies that ideas are diffused inside a territory of one group from an adjacent one. These ideas are reinterpreted by the borrower group, depending on the contact type between the two groups, and noticeably depending on the level of social intimacy. Episodic contacts at places with a low degree of social intimacy, like along the pathways, are opposite to intimate contact at residential sites where not only the end-product can be observed but also the process of manufacturing it can be observed, learned, and reproduced. Depending on the degree of social intimacy and social organization of each group, the results of contact would vary from conservatism up to total integration of procedures (Tostevin 2007). Given the geography and the age of the Châtelperronian and of the Protoaurignacian (see above), given the similarity between Protoaurignacian retouched bladelets that could have been lost during the hunt along pathways, and given the fact that they were produced using different processes, it is indeed probable that the idea of Dufour bladelets diffused from one group to the other. This could have been the case on pathways, for instance, and would then imply a low degree of social intimacy between the two groups (Roussel 2011). The nature and style of personal ornaments could also be explained by a similar process.

Conclusions

The Châtelperronian is an early Upper Paleolithic industry with blade and bladelet production, personal ornaments and bone-tool production and use,

and without any formal flake production. The debate around it fundamentally changed when an almost complete Neanderthal skeleton was discovered and associated with it at Saint-Césaire, confirming the earliest discoveries of Neanderthal remains made at Grotte du Renne. From then on, what was initially considered as a fully Upper Paleolithic industry started to be called a "transitional industry" in order to reconcile the archaic biology of the authors and the advanced nature of the industry. Nonetheless, except at some exceptional sites, the Châtelperronian is a well-defined and fully Upper Paleolithic industry that is neither a mix nor an intermediary between industries, as suggested by the unfortunate term "transitional." It is only transitional because it is in stratigraphic sequences after the Mousterian and before any other Upper Paleolithic industry.

The Châtelperronian is always replaced by the Aurignacian: the stratigraphic position of the Châtelperronian suggests a global shift. Still, this does not preclude contemporaneity and long-distance contact between the Neanderthal makers of the Châtelperronian and other groups, especially with anatomically modern humans using Protoaurignacian technology. The diffusion of the idea of Dufour bladelets from one group to the other, in the absence of diffusion of the process used to manufacture them, would imply a low degree of social intimacy and only episodic contacts on non-residential sites.

Cross-References

- ▶ European Middle to Upper Paleolithic Transitional Industries: A Socioeconomic Approach
- ▶ *Homo neanderthalensis*
- ▶ Neanderthals and Their Contemporaries

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European Upper Paleolithic Rock Art: Sacredness, Sanctity, and Symbolism

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Introduction

Where, Why, and How

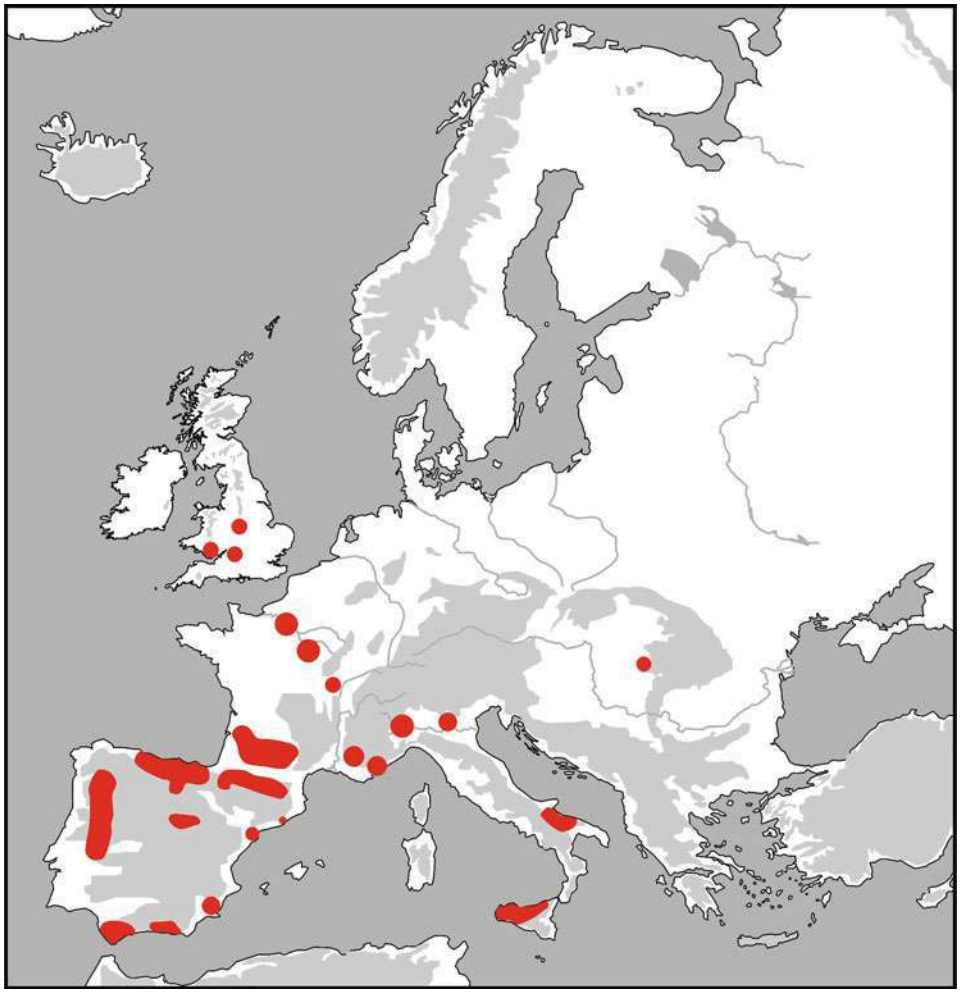
In this entry, I discuss, albeit briefly, the evolutionary development and research history relating to Upper Paleolithic parietal rock art in Europe which, based on current research, probably represents more than 30,000 years of artistic endeavor. The physical act of producing art is not confined to engravings and paintings on static surfaces; a significant portable art assemblage comprising engraved antler, bone, and ivory, and often occurring alongside cave and rock-shelter rock art, is also attested over the same period. Cave contexts have, in addition, revealed sculptures (e.g., *finger flutings*) and bas-relief images carved from clay, such as the two clay bison at Tuc d'Audoubert (Ariége), the sculpted head of a horse at Camargue in the Dordogne, and plaquettes – simple animal- and human-engraved images on stone and clay tablets. In the past labeling, these assemblages as "art" have proved contentious (see Ucko and Rosenfeld 1967); it is my view that these aesthetically potent artistic forms represent a visual communication but, at the same time, that it was probably restricted to certain members of a stratified society, possibly as part of a process of initiation or a way of a community communicating with the spirit world, deep within the recesses of a cave (Clottes 2004).

A quarter of a century ago, research was focused on two areas: southwest France and northern Spain, that is, the Franco-Cantabrian region. However, during the early 1990s following a number of major dam projects affecting several major river systems in northern and central Portugal, engraved Upper Paleolithic rock art was discovered on a large number of open-air rock panels within the Douro, Tejo, and Tagus Basins and, in particular, in the Cô a, Ocreza, and Zezere Valleys and along the Guadiana River.

Based on discoveries elsewhere, it was becoming clear that the phenomenon of carving and painting reached well-beyond the Franco-Cantabrian region, extending into areas of Atlantic, Mediterranean, and southeast Europe and as far north as the British Isles. More significant (and indeed controversial) is the recent use of chronometric dating at a number of rock-art sites, including the famous Altamira and El Castillo caves in northern Spain, the results of which place the art in an almost inconceivably early time frame, contemporary with the presence of Neanderthals in southern Europe (Pike et al. 2012).

The geographical range of Upper Paleolithic rock art remains a major source of contention among specialists. However, recent years have witnessed the discovery of painted and engraved imagery of this period in the British Isles (Bahn and Pettitt 2009; Nash et al. 2012), Hungary, Germany (Bahn and Vertut 1988), and Romania (Clottes et al. 2011), extending considerably the known geographic range (Fig. 1).

Until the mid-1990s around 300 parietal art sites were known, mostly within the limestone



European Upper Paleolithic Rock Art: Sacredness, Sanctity, and Symbolism, Fig. 1 The rock-art core areas of Upper Paleolithic Europe

gorges and deep river valleys of the Dordogne, Loire, and Pyrenees regions of southwest France and the limestone mountain cliffs of northern coastal Spain (Bahn and Vertut 1997). The last century saw the discovery of a spectacular repertoire of images, mainly comprising vibrant and naturalistic depictions of animals and utilizing a variety of ingenious techniques.

The techniques employed by the artiest varied from region to region. The Franco-Cantabrian region is characterized largely by the use of organic or inorganic pigments applied to mainly smooth contoured panels on cave walls or ceilings using fingers, sticks, or feathers. Shades of red ochre (or hematite) or charcoal are commonly used, and it is from minute fragments of charcoal within the pigment that scientists have obtained dating evidence using chronometric methods (e.g., Accelerator Mass Spectrometry [AMS]). Caves possessing paintings may also contain engravings and examples of finger fluting (created onto wet or soft clay), suggesting the cave was frequented by different artists at different times. Pecking was evidently the preferred engraving technique on open-air panels, used especially in northern and central Portugal and Spain, where large superimposed images of animals such as bison and horse are found. The

topography of the panel was also widely used (e.g., at Chauvet Cave), enabling the artist to create sometimes three-dimensional figures.

Historical Background: You Reap What You Sow

The initial period of discovery and interpretation spanned the late nineteenth/early twentieth century and focused principally on Upper Paleolithic cave art; however, this period coincided with a number of important archaeological discoveries elsewhere in the world relating in particular to portable (or mobiliary) art. The scientific community at this time, reinvigorated by Darwin's revolutionary ideas, found itself locked in battle with the various religious orders of Europe. Furthermore, intense rivalries between European universities and individuals vying for academic supremacy tended to cloud judgment and led to the persistence of some entrenched and timeworn ideas. Doubt was therefore cast on many of the major discoveries in France and Spain in the belief that early modern humans were incapable of producing elaborate narratives on rock surfaces. Even if these images were authentic, it was held, they represented nothing more than idle doodling "art for art's sake."

The first discoveries of parietal art were met with skepticism and, in some cases, outright rejection, the most infamous being Europe's first scientific discovery at the cave of Altamira in northern Spain. The site and its wealth of art were made public in 1880, but controversy soon followed. The cave was discovered by Marcelino Sanz de Sautuola and his daughter in 1879. Before this, the cave entrance had been blocked by a landslide that occurred around 13,000 years ago. Later that year, the cave floor was excavated by Sautuola and academic archaeologist Juan Vilanova y Piera from the University of Madrid. Following publication of the excavation, French scientific verifiers Emile Cartailhac and Gabriel de Mortillet completely rejected the authenticity of the rock art, intimating that it was a forgery. As a result, Sautuola and Piera were scorned at the International Congress for Prehistoric Anthropology and Archaeology held in Lisbon in 1880. Rejection was based on the excellent state of preservation of the rock art and the notion that such complex art could not have been produced by such primitive people. Rumors within Spain suggested that Sautuola had actually commissioned artists to produce the paintings.

Following the Altamira debacle, a number of high-profile rock-art discoveries were made, suggesting that Paleolithic people were indeed capable of producing complex forms of artistic endeavor, which led to Sautuola and Piera being finally vindicated in 1902. Emile Cartailhac made a formal and open apology to Sautuola's daughter (Sautuola had died in 1888) and published Mea culpa d'un sceptique, wherein he admitted he had been wrong and had held back the science and study of Paleolithic rock art for many years. The public outpouring of guilt and apology appears to have benefited Emile Cartailhac, allowing him to accompany French cave expert the Abbé Henri Breuil on a number of expeditions in the Franco-Cantabrian region. This collaboration resulted in the discovery of 150 painted rock-art images in the Grotte de Niaux in the Pyrenees (Fig. 2).

European Upper Paleolithic Rock Art: Sacredness, Sanctity, and Symbolism, Fig. 2 Painted ibex from Grotte de Niaux (Image: Courtesy of Jean Clottes)

The Floodgates Open

Most discoveries in the core areas of Europe, particularly in Franco-Cantabria and southern Italy, were made during the first part of the twentieth century. Henri É douard Prosper Breuil, often referred to as the Abbé Breuil, began his adult life as a priest (ordained in 1900) but soon developed a keen interest in prehistory. He was responsible for the discovery and authentication of a number of important Upper Paleolithic rock-art cave panels in the early twentieth century, including red-ochre decoration in Bacon Hole, on the South Wales coast. Breuil's influence spanned some 60 years until his death in 1961. His early travels took in most of the prehistoric world and involved him either in discovery or in verification. Much of what he said was widely accepted by academic colleagues and the general public. Breuil took the stance that rock art was part of a ritual package, the ultimate objective of which was the successful hunting of large animals. Based on direct observation of the Arunta people of Central Australia, Breuil proposed that Upper Paleolithic hunting parties would don masks and animal pelts to perform ceremonies in the guise of their quarry. They would then paint images of the animal on the walls of a cave. The ceremonial performance and the act of depiction created a potent source of magic that would, it was believed, guarantee a successful hunt. Ceremonial performances may have incorporated the act of killing an animal – involving the use of sympathetic magic – and this act would also have assisted in the ritual act of the hunt. Breuil further suggested that the multiple images found on cave walls represented attempts to increase the fertility of the herds, with each generation of artists adding their signature to an increasingly complex and potent narrative (Breuil 1952). Though plausible, Breuil's interpretations have been heavily criticized since his death. Many of the animals depicted are seldom found in the archaeological record of Upper Paleolithic habitation sites, and furthermore, animals such as the bear, felines, hyena, and rhino probably formed no part of the hunters' diet, so why are they depicted? The ferocity of such predators may have served as some form of totemic identity, giving the artist and his or her respective clan potency and power over others.

Arguably, one of the most influential theorists of the twentieth century was the French anthropologist André Leroi-Gourhan, who defined a series of stylistic stages within the development of Upper Paleolithic art (styles I–IV) (Leroi-Gourhan 1982). These styles coincided with successive cultural periods within the Upper Paleolithic and suggested that rock art evolved from primitive to complex compositions over a period of some 20,000 years, from the Aurignacian and Gravettian (style 1) to the later Magdalenian (style IV). This attempt to develop a hierarchal artistic chronology was met with considerable opposition, although it did gain momentum outside the rock-art world as a plausible hypothesis. Critics were concerned with the rigidity of Leroi-Gourhan's model, suggesting that the development of a complex art form from simple motifs to high artistic achievement was far too simplistic. Although this hypothesis was largely acknowledged, advancements in chronometric techniques, particularly the development of AMS and uranium-series dating during the latter part of the twentieth century, suggested a more complex picture. Many rock-art panels included within Leroi-Gourhan's stages III and IV, for example, which he dated to the latter part of the Upper Paleolithic, are now considered much earlier (e.g., Clottes and Geneste 2012; Pike et al. 2012).

Key Issues/Current Debates: A Plethora of Images in a Multitude of Places

The archetypal Upper Paleolithic cave site is Lascaux, located near the town of Montignac in southwest France. Discovered in September 1940 the cave system is currently closed to the public and scientific community alike due to the formation of fungal molds that have been affecting the paintings for some time. The access restrictions have curtailed scientific work, and until opportunities arise for further research.

The consensus view based on analogy elsewhere places the rock art at around 17,000–18,000 years

BP. However, based on the results of chronometric dating elsewhere within the Franco-Cantabrian region, the Lascaux assemblage could be much earlier. The dominant theme of the panels in this cave is the depiction of large animals such as bison, bovines, horse, and red deer. Each category of animal comprises a thematic area within the cave, these areas being aptly named the Great Hall of the Bulls and the Chamber of Felines for example.

The cave was accidentally stumbled upon by four teenagers and a dog and was opened to the public in 1948. However, by the mid-1950s the carbon dioxide expelled by over 1,000 visitors a day had taken its toll on the paintings, and the cave was closed in 1963. An extensive conservation program ensued and the cave was strictly monitored for atmospheric and temperature changes. In order to fulfill the public's overwhelming desire to see these amazing works of art, the French heritage authorities in 1983 commissioned several facsimile sections of the cave – Lascaux II – to be constructed close by. In spite of the restrictions on entry to the cave, monitoring has, since 1998, revealed an aggressive fungus that is attacking the fragile pigments. This fungal infestation was caused by a recently installed air-conditioning system and by heat emitted from a lighting system. Since 2008, atmospheric monitoring has been tightened.

One of the most intriguing caves within southwest France is, in my view, the example of Rouffignac (within the commune of Rouffignac-Saint-Cernin-de-Reilhac). Known as the Cave of the Hundred Mammoths, the back section of the cave contains over 220 engravings and paintings/drawings, including 158 mammoths, 28 bison, 15 horses, 12 goats, 10 woolly rhinoceros, and one brown bear. In addition to the painted imagery, the cave also has 17 tectiforms and 6 serpentine forms, as well as finger flutings and finger meanders, thought to have been executed by children. The majority of the art is located some 2 km inside the deep recesses of the cave, within an area called Le Grand Plafond chamber. More than 60 animals, mainly mammoth, are painted/drawn (sketched) on the ceiling using mainly charcoal with some drawn as a black outline. Interestingly, the artistic repertoire omits red deer and aurochs. Based on Leroi-Gourhan's stages, the rock art of Rouffignac falls within style IV and, therefore, dates to the Middle Magdalenian period (c. 13,000 years BP). Unfortunately, very little archaeology survives, except for a very small lithic assemblage. In the recent past, the authenticity of the art has been questioned and subsequently denounced by some. In common with other caves in the region, parts of it were periodically occupied by European brown bear, probably during periods of hibernation.

Within the entrance to the cave, archaeologists have found evidence of Mesolithic and Neolithic activity consisting of hearths, animal bone, and a small diagnostic lithic assemblage. The earliest date for this activity is c. 9,200–7,800 years BP. In terms of stratigraphy, this material was sealed later by Iron Age activity.

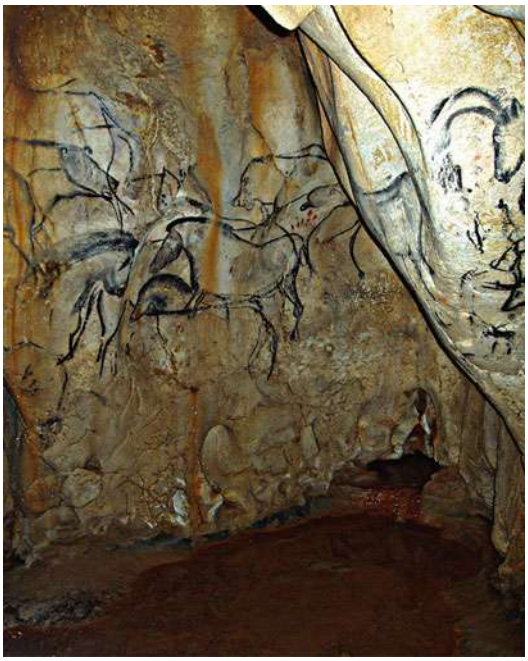
Also within southern France is probably one of the most important discoveries of recent years. The cave site of Chauvet, located in the Ardéche southeast France, sits within a limestone cliff face overlooking the former course of the Ardéche River and was discovered on December 18, 1994 by a group of speleologists, including Jean-Marie Chauvet. Following discovery, French rock-art specialist Jean Clottes conducted a detailed study of the cave and its spectacular rock art. Chauvet is one of many hundreds of caves that sits within the deep gorges of the Ardéche region.

Chronometric dating of the rock art and archaeological deposits has revealed two distinct periods of use. To date, over 120 samples have been taken by Clottes' team from pigments that include charcoal. This sampling has revealed that Chauvet was in use during the Aurignacian period, the earliest confirmed date being 32,900 $\pm$ 490 years BP (Gifa 997776). Archaeological evidence, in the form of children's footprints, hearths, and fire torches, suggests that the cave was also in use during the latter part of the Gravettian, between 25,000 and 27,000 years BP. A landslide appears subsequently to have sealed the cave entrance until its discovery in 1994. During these periods of Early Upper Paleolithic (EUP) occupation, the cave appears to have been utilized as a hibernation den for brown bear, with both skeletal remains and hibernation nests being found. Despite the widely

accepted radiocarbon dates for Chauvet, several archaeologists have questioned the dating (Pettitt and Bahn 2003). Their concerns have been based on potential surface contamination and the link between charcoal deposits on the floor of the cave and those used within the composition of the painting. However, Pettitt and Bahn's concerns have now been dispelled, as, by 2011, more than 80 additional radiocarbon samples were taken from torch marks, floor deposits, and the paintings unequivocally push the dates of the rock art to between 35,000 and 30,000 years BP. Furthermore, chemical analysis on deposits within the only entrance area of the cave revealed that this was sealed by a landslide around 25,000–29,000 years BP and that the main occupation was between 30,000 and 35,000 years BP (Clottes and Geneste 2012).

The rock art includes many hundreds of painted polychrome and monochrome animal figures representing at least 13 generic species depicted in a naturalistic style, many of which are now extinct. In addition to the usual range of herbivores, such as bison, horse, and mammoth, are certain predatory species, the presence of which is, arguably, unique to the cave; these include brown bear, cave lion, hyena, and panther (Fig. 3). Many animal figures are grouped to form herds of bison, horse, panther, and rhinoceros; each group is enhanced by use of the panel/surface topography to create three-dimensional imagery and the illusion of movement across the panel.

Although complete human figures are virtually absent, sexual attributes, including vulvae, are present, along with body parts, such as legs and hand stencils. These figures may represent personal signatures of the artists or special people who witnessed the art being executed. David Lewis-Williams and Jean Clottes (1998) have further argued that the combination of subject and location, that is, within the deep recesses of the cave, suggests a ritual significance and that these images evoked possible shamanic and magical powers. Unlike Upper Paleolithic rock art elsewhere, a great deal of panel preparation appears to have taken place, with the rock surface being scraped clean of mold debris and flowstone concretions. This cleaning resulted in a notably near-smooth white "canvas" on which to paint the images.



European Upper Paleolithic Rock Art: Sacredness, Sanctity, and Symbolism, Fig. 3 The wealth of animal depictions in Chauvet Cave (Image: courtesy of Jean Clottes)

Still within the Franco-Cantabrian region is the cave that started all the interest in Paleolithic rock art – Altamira, sitting within limestone rock outcropping on Mount Vispieres, along the northern Spanish coast. The cave is noted for its fine polychrome paintings of bulls and for hand stencils. The cave entrance formed by a major rock collapse from above the cave was discovered in 1880. The cave extends some 270 m in length and comprises a series of distorted passages and chambers. Following discovery, a section of the cave floor was excavated to reveal a rich stratigraphic sequence dating to a period spanning the Upper Solutrean (c. 18,500 years BP) to the Lower Magdalenian (c. 16,500 and 14,000 years BP). The cave was also intermittently occupied by hibernating animals. At round 13,000 years BP, a rock fall sealed the entrance, around which, according to archaeologists, most human occupation was concentrated. The rock art, though, extends right along the length of the cave.

Charcoal and hematite were used to create the polychrome images. Sometimes these natural

pigments were mixed with water to create shading and to vary the intensity of color (referred to as chiaroscuro). Polychrome images are strategically painted to take advantage of the natural contours and topography of the panel. The cave contains a plethora of images and features the famous polychrome ceiling depicting a herd of extinct steppe bison (*Bison priscus*) arranged in a number of poses. Other animals include horse, deer, and a wild boar. In 2008, uranium-thorium series dating was applied to samples of calcite covering some of the rock art. The results indicated that the art spanned 10,000 years, between 25,000 and 35,000 years BP (Pike et al. 2012). Similar to Lascaux, Altamira is now closed to the public due to concentrations of carbon dioxide produced by large numbers of visitors damaging the microclimate of the cave.

Moving West: The Engraved Rock Art of Central and Northern Portugal

Before 1991, it was considered that Upper Paleolithic rock art was concentrated within two areas of southwest Europe. However, in advance of a highly controversial dam project in the Douro Basin, significant engraved open-air rock art was discovered, in particular within the Côa Valley (a tributary of the Douro) in northeast Portugal. In addition to the Upper Paleolithic assemblage, later prehistoric engravings were also found in association with carvings dating from the seventeenth century. From this initial discovery, archaeologists began to look elsewhere and as a result both Upper Paleolithic and later prehistoric rock art were found in the Sabor, Agueda (both Portugal and Spain), and Tua Valleys. Within the central eastern part of Portugal, further Upper Paleolithic rock-art discoveries were made within the Tejo/Tagus Basin, particularly in the Ocreza and Zezere Valleys and also within the Guadiana River.

Most of the engraved art within the Côa Valley extends along 17 km of vertical schist outcropping and comprises mainly large naturalistic zoomorphic images, such as horse, auroch, caprid, cervid (red deer), a rare occurrence of fish, and a small assemblage of geometric/abstract forms (Fig. 4). Much of the imagery is superimposed (over 1,000 engraved images on 137 panels). Several engraved panels also occur on granite. On the panel of Faia are engravings that have evidence of image enhancement through the application of red ochre (hematite). On both geologies, artists appear to be concerned with the vibrancy of the animal through movement and physical interaction. The engraving techniques include incised pecking, which produces fine linear imagery (Zilhão 1995).

The dating of this assemblage, probably the largest concentration of early prehistoric open-air rock art in Europe, is potentially difficult to assess. However, broad dating based on artistic style and complexity places much of the imagery between 22,000 and 10,000 years BCE.

During the so-called Battle of the Côa, both the Portuguese Government and the energy company EDP played down the international significance and dating of this assemblage. Experts employed by EDP applied a controversial unproven direct dating technique which dated the imagery to the later prehistoric period. Fortunately, a change of government in 1995 reversed

European Upper Paleolithic Rock Art: Sacredness, Sanctity, and Symbolism, Fig. 4 A plethora of wild animal engravings from the Fariseu 1 panel, Côa Museum (Author)

the decision to dam this and other valleys in this part of Portugal, and as a result, the Côa Valley was designated a World Heritage Site in 1998.

Moving North to a Very British Assemblage

Until 2003 and the sensational discovery of engraved imagery at Church Hole Cave near the mining village of Creswell, it was considered by many that a human presence in the British Isles between 12,000 and 27,000 years BP was, at best, limited to a few seasonal hunting visits in southern Britain. However, the famous early Upper Paleolithic burial at Paviland Cave on the Gower Peninsula, in South Wales, contradicts this assumption. The burial, originally thought to be a Roman prostitute and known as the "Red Lady of Paviland," was excavated by the geologist and creationist William Buckland in 1823. By the time of the second investigation of the cave in 1912–1913, a comparison had been made between the finds and deposition at Paviland and Upper Paleolithic discoveries in other European caves. Following a series of successive radiocarbon dates from the 1960s until the present, the date of this remarkable site has been advanced from Kenneth Oakley's date of 18,460 ± 340 years BP to 33,000 years BP, based on recalibrated test results by Thomas Higham and the late Roger Jacobi.

Prior to a recent discovery of an engraved reindeer in a cave in South Wales, only one other authenticated discovery had been made, at Church Hole and Robin Hood Caves, Creswell Crags, on the Derbyshire/Nottinghamshire border in April 2003 (Bahn and Pettitt 2009). These figures are considered to be Europe's most northerly Paleolithic rock art. This discovery included a small number of anthropomorphic and zoomorphic engravings and bas-relief figures, including a bison, red deer, and several avian species (Fig. 5). The engravings were overlain by a thin veneer of calcium carbonate flowstone and were ascribed a minimum age of 12,800 BP using the uranium-series disequilibrium dating method (Pike et al. 2005). Several of these figures, including the red deer, used the natural topography of the cave wall to construct or enhance various parts of the animal, a common theme running throughout European Upper Paleolithic and Mesolithic rock art.

European Upper Paleolithic Rock Art: Sacredness, Sanctity, and Symbolism, Fig. 5 Probable head and neck of two cervids, located deep within a recess of Church Hole Cave, Creswell, England (author)

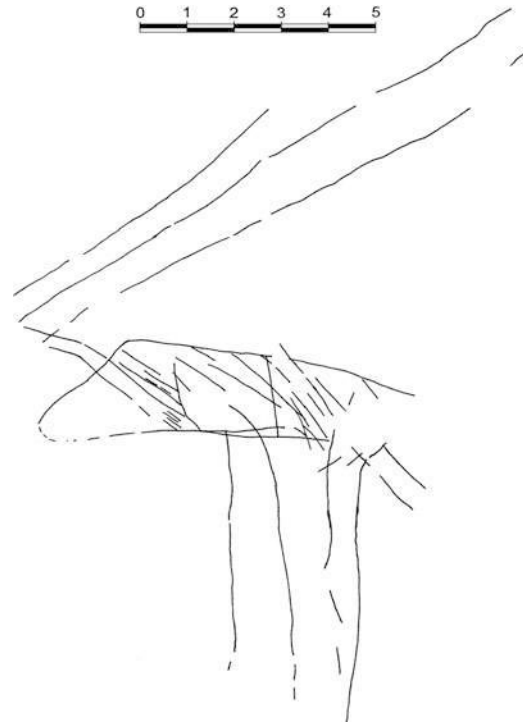
Associated with the Creswell discovery, and recovered from other nearby caves within the gorge, were a number of Upper Paleolithic engraved mobile artifacts discovered during the course of late nineteenth and early twentieth century excavations (Bahn and Pettitt 2009). These included Creswell's infamous horse, which had been carved on a piece of rib bone and discovered in 1876, and a bird-like head on a human torso, which had been carved on a piece of bone from a woolly rhinoceros (Coelodonta antiquitatis), a species considered to have become extinct in Britain by around 15,000 BCE. The presence of these exotic artifacts, along with a handful of other portable "valuables" from other Upper Paleolithic core areas of Britain, including perforated shell and stone made for garment decoration, necklaces, and pendants, is set against a backdrop of sometimes rapid climatic amelioration.

Prior to the Creswell discoveries, there had been several "false dawns," where Upper Paleolithic rock art had been discovered and authenticated but later rejected. One of these so-called discoveries occurred at Bacon Hole on the Gower Coast in 1912, when experts of the day – the French prehistorian and verifier, Abbé Henri Breuil, and W. J. Sollas – reported in *The Times*

(14 October) the discovery of 10 parallel red streaks of hematite within one of the recesses of the cave. The Times reported it as "the first example in Great Britain of prehistoric cave painting." However, this discovery turned out to be either natural hematite secretions or paint, possibly from a sailor merely cleaning his brushes, and was subsequently rejected by 1928. A second discovery, made in the Wye Valley of South Herefordshire in 1982, was claimed as Britain's first representative Paleolithic rock art and included the outline of a bison and a red deer, among other animals, from Cave 5615, located high above a deep gorge known as Symonds Yat. The discovery was duly reported in the popular press and later the academic world but lacked any expert validation, and, following a series of personal attacks, rebuffals, and a confession or two, the discovery was soon rejected.

In September 2010, the author was exploring the rear section of Cathole Cave, a limestone cave that stands within the eastern part of an inland valley on the Gower Peninsula. The cave had been first excavated during the latter part of the nineteenth century. An array of flint tools, metal implements, and pottery dating from the Upper Paleolithic to the Bronze Age were recovered, plus a significant Pleistocene faunal assemblage that included (extinct) elephant, giant deer, hyena, woolly rhinoceros, wolf, and reindeer. Further two excavations outside the cave were made by Charles McBurney and John Campbell in 1958–1959 and 1977, respectively. Recovered from these two excavations were more than 300 lithics, many of which were diagnostically similar to flint blades and points found at other so-called Creswellian cave sites at Creswell Crags and within Cheddar Gorge.

The engraving of a stylized cervid, possibly a reindeer, was on a small vertical niche. This side-on view figure, measuring approximately 15 × 11 cm, was created using a sharp pointed tool, probably made of flint (Fig. 6). The elongated torso was infilled with irregular-spaced vertical and diagonal lines. Several internal diagonal lines extended below the lower section of the torso, merging to form three of the four legs, the longest measuring 4.5 cm. Incorporated into the left side of the torso is the head (or muzzle)



European Upper Paleolithic Rock Art: Sacredness, Sanctity, and Symbolism, Fig. 6 Tracing and image of a cervid, possibly a reindeer from Cathole Cave, South Wales

comprising a semicircular snout, chin, and mouth. Above the muzzle was a thin rectangular block on which three lines extend to the right forming a stylized antler set. The various engraved lines were cut into a weakly botryoidal calcite flowstone surface. In April 2011, members of the NERC-Open University Uranium-Series Facility extracted samples from the surface on which the engraving was located for uranium-series dating, along with a sample from a section of flowstone that covered a section of the reindeer's muzzle. Two minimum dates from the flowstone of 12,572 ± 600 years BP and 14,505 ± 560 years BP were revealed, making this engraving Britain's earliest rock art (Nash et al. 2012).

Future Directions

Over the past 65 years and since the death of Abbé Breuil and Leroi-Gourhan, Paleolithic rock-art

research has come of age and is now incorporated into mainstream archaeology. Following the sometimes novel ideas and concepts of late nineteenth and twentieth century archaeologists and scientists engaged in the study of Paleolithic art, a new chapter has emerged which includes the pioneering and polemic work of Paul Bahn, Robert Bednarik, Michel Lorblanchet, Jean Clottes, David Lewis-Williams, David Whitley, and Joao Zilhão (to name but a few), each scholar adding new ideas to an otherwise healthy rock-art debate. Foremost in this revolution are the groundbreaking and sometimes controversial approaches of Jean Clottes, David Lewis-Williams, and Thomas Dowson and their ideas on how Paleolithic rock art formed part of a shamanistic performance (Lewis-Williams and Dowson 1988; Lewis-Williams and Clottes 1998; Lewis-Williams 2002, 2003). It is clear from these principal scholars that rock art is polysemic and once formed part of a much wider ritual-symbolic package that was probably initiated and controlled by the hierarchical will of clan elites. The animal-bias may suggest some form of totemic relationship between the individual artist, the hunter, and the hunting community alike.

Current ideas, now supported by hard science, consider earlier dates of an otherwise entrenched chronology (e.g., Pike et al. 2012). Through direct dating methods, Bahn and Vertut (1988: 75) clearly show a spread of chronometric dates taken from pigments from a number of caves from the Franco-Cantabrian region, the most recent being Le Portel (Ariége) at 11,600 ± 150 years BP (AA 9766), to the earliest, Chauvet 32,410 ± 720 years BP (Gif A 95132). Since the publication of this summary, further, more refined dates have been accomplished (Clottes and Geneste 2012).

In June 2012, a British-Spanish scientific team revisited 11 caves with Upper Paleolithic rock paintings and engravings in northern Spain (part of the Franco-Cantabrian area of Upper Paleolithic southwest Europe). Many of the sites, including Altamira, El Castillo, and Tito Bustillo, had been previously dated based on artistic style and indirect dating methods. Using uranium-series disequilibrium dating on calcite deposits overlying and underlying the paintings, the team was able to date the rock art

European Upper Paleolithic Rock Art: Sacredness, Sanctity, and Symbolism, Fig. 7 Dated hand stencils from the cave of El Castillo, Northern Spain (Image: Marcos García Diez)

(Fig. 7). The results revealed that the art, which included a painted red disk, a hand stencil, and a claviform symbol, dated to the Early Aurignacian period, with a minimum age range for the art of between 35,600 and 40,800 years BP, a time when either the first wave of anatomically modern humans moved into Europe or maybe when Neanderthals were involved in artistic endeavor.

A few months earlier, within the cave of Nerja, near Malaga, in southern Spain, further probable painted rock art of Neanderthal date was discovered; I say "probable" as the dating material from a floor deposit was indirectly associated with the actual rock art that was until recently believed to be Upper Paleolithic.

Where next? Attention once focusing entirely on the traditional centers of southwest Europe appears to be shifting further east and north. Over the past 10 years, significant discoveries have been made in Italy, Romania, and the British Isles. This, along with the recent dating program within the 11 caves in northern Spain, extends the work of the Paleolithic artist geographically and deeper into our distant past. Just a few years ago, who could have conceived the idea that the painted rock art could have possibly been executed by Neanderthals?

Cross-References

- ▶ Altamira and Paleolithic Cave Art of Northern Spain
- ▶ Art, Paleolithic
- ▶ Bednarik, Robert G.
- ▶ Côa Valley Rock Art Sites
- ▶ Europe: Paleolithic Art
- ▶ Iberian Mediterranean Basin: Rock Art
- ▶ Lewis-Williams, James David
- ▶ Siega Verde Rock Art Sites

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Evans, Arthur

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Basic Biographical Information

Arthur John Evans was born on 8 July 1851 at the Red House, Nash Mills, Hertfordshire (Brown 1993: 11). He died at the age of 90, on 11 July 1941, but not before he became a well-known archaeologist for his discovery and excavation of the Palace of Minos at Knossos (Ashmolean Museum 2012). Evans was the eldest child of John Evans' who was also a well-known archaeologist as well as a numismatist, geologist, and collector of antiquities (Brown 1993: 11). As a result of his fathers occupation, Arthur Evans was brought up

surrounded by archaeology and history-related subjects. This sparked his interest in such a career at a young age. Starting at the age of 9, Evans accompanied his father on expeditions where his interests in archaeology grew (Brown 1993: 11).

Arthur Evans was educated at Harrow School and went on to study at Brasenose College in Oxford. Even though his schooling achievements were academically modest, Evans won prizes for his English poems and Greek epigrams (Brown 1993: 11). In 1874 he graduated from Brasenose College and was awarded first-class honors in Modern History (Ashmolean Museum 2012). In 1884 Evans was appointed the role of a Keeper at the Ashmolean Museum (Ashmolean Museum 2012). During the 25 years that he worked as a Keeper at the museum, he was able to successfully and drastically increase the archaeological collections and transform the Ashmolean into an archaeological museum that garnered international recognition as a first-rate research institution (Ashmolean Museum 2012). Including his work at the Ashmolean Museum, Evans was known to be a pioneer in the identification of Roman cities and roads in Bosnia and Macedonia as well as mapping the Roman road system and leading smaller excavations in the Balkans (Ashmolean Museum 2012). Prior to his excavations at Knossos, Evans carried out an illicit excavation of a Roman cemetery near Trier where he found lamps and broaches (Brown 1993: 17). At this time he was working as a journalist while also pursuing his interests within archaeology (Brown 1993: 21). At Canali, Evans started an excavation of a large barrow, but this was interrupted by the war that broke out between the Turkish and Montenegrins. Later, he was able to continue the excavation (1993: 21).

Even though he was travelling through different countries and working as a Keeper at the Ashmolean Museum, from 1893 onwards his interests in Greece, mainly Crete, grew (Ashmolean Museum 2012). Between the years of 1894 and 1899, Evans travelled extensively through Crete in search of evidence pertaining to pre-alphabetic writing in the Aegean (Ashmolean Museum 2012). This search led him to identify three systems of writing: Cretan Hieroglyphic, Linear A, and Linear B (Ashmolean Museum 2012).

Major Accomplishments

Arthur Evans is best known for his excavations of the Palace of Minos at Knossos, Crete, which he started on 23 March 1900 at Kefala Hill in Knossos (Brown 1983: 15). Evans interests in Crete began after visiting an antiquities shop in Athens in 1893, where he noticed an unidentifiable writing system on small three or four-sided Cretan stoned seals (Stiebing 1993: 135). The following year, 1894, would be when he visited the island of Crete for the first time where he noticed surface indications of preclassical occupation at the site of Knossos (Stiebing 1993: 135). Even though the war between Greece and Turkey did not allow Evans to return to Crete until 1899, he was still able to acquire title to the site of Knossos, and he began to draft his plans for excavation (Stiebing 1993: 135). When he began the excavation in 1900, even though he had very little experience, Arthur Evans was joined by more experienced researchers which included Duncan Mackenzie and D. G. Hogarth (Brown 1983: 15). Between 1900 and 1905, the majority of the Palace of Minos was found and excavated (Stiebing 1993: 135). The walls of the structure were located just below the surface as Evans was uncovering parts of frescoes and a stucco relief that decorated the palace walls, while many pieces of pottery and oblong clay tablets were also found during this excavation (Stiebing 1993: 135). At first, the artifacts that Evans discovered were thought to be "Mycenaean"; however, as he continued to uncover underlying strata, he came to realize there had already been a high level of cultural development among the occupants of Knossos prior to the Mycenaean Age that he named "Minoan" (Stiebing 1993: 135). Evans distinguished many different pottery types as well as styles of decoration at Knossos. On the basis of these finds, he created a chronology for the prehistory of Crete (1993: 139). Subsequently, the presence of datable Egyptian objects in some of the Minoan strata allowed Evans to provide approximate absolute dates for his sequence (Stiebing 1993: 139).

As well as excavating the palace at Knossos, Evans also extensively restored the remains of the site (1993: 136). Once the palace had been excavated as well as restored, Evans published his findings in four volumes, as *The Palace of Minos*

at Knossos (Scarre and Stefoff 2003: 6). There has been extensive criticism of Evans' excavations and restorations due to the personal nature of the site (Stiebing 1993: 136). While the visitor at this site is able to form a great mental picture of the Palace of Minos in comparison to other Cretan sites, it has been argued that this picture is seen largely through Arthur Evans's eyes (Stiebing 1993: 136).

Cross-References

- ▶ Conservation, Restoration, and Preservation in Classical Archaeology
- ▶ Crete, Archaeology of

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Evolutionary Anthropology: Issues, News, and Reviews

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Brief Definition of the Topic

Evolutionary Anthropology is a peer-reviewed journal focusing on current issues in biological anthropology, paleontology, archaeology, primatology, genetics, human ecology, and other areas pertinent to understanding human evolution in a broad perspective. It is designed to provide researchers, educators, and students in anthropology and related disciplines with reviews of recent research, discussions of theoretical issues, and changing perspectives on human evolutionary biology in a concise, readable format. It was founded in 1992 by Dr. John Fleagle and appears in six bimonthly issues each year. *Evolutionary Anthropology* normally publishes four types of articles:

1. *News Articles* are brief reports on recent professional meetings, symposia, workshops, and other events of general interest to the anthropological community.
2. *Issues Essays* are articles on subjects of broad interest to topical interest and are designed to raise awareness of important topics in the study of human evolution that have perhaps been overlooked or not widely known, but are not suitable for a major review. Issues Essays can take more of a personal or adversarial approach rather than offering a scholarly review.
3. *Articles* are minireviews of up to 10,000 words that provide an overview of the current state of knowledge on a topic of general interest to a wide audience of students, teachers, and researchers in the broad area of human evolution. They should provide a balanced treatment of current literature and views.
4. *Book Reviews* are designed to discuss recently published books in the broader context of current research in the area to which the book contributes.

In addition to the above, *Evolutionary Anthropology* also publishes obituaries of prominent figures in the field of human evolution and sometimes publishes essays from regular contributors. In the 1990s, the journal published a series of debates between Ian Tattersall and Milford Wolpoff on topics in human evolution. In the early part of the twenty-first century, Dr. Kenneth Weiss contributed a regular series of essays on aspects of genetics and evolution entitled *Crotchets and Quiddities*. Beginning in 2008, *Evolutionary Anthropology* published one special issue a year devoted to a

single topic. The first of these were Modern Human Origins (2008), The Evolution of Human Behavior (2009), and Genetics and Human Evolution (2010).

In 2018, Dr. Jason Kamilar assumed the position of journal editor. In addition, the editorial board was expanded from 11 to 30 members, all who are leaders in the field.

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Cross-References

► Journal of Human Evolution

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Excavation Methods in Archaeology

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Introduction and Definition

Archaeological excavation is the procedure by which archaeologists define, retrieve, and record cultural and biological remains found in the ground. Past activities leave traces in the form of house foundations, graves, artifacts, bones, seeds, and numerous other traces indicative of human experience. These *strata* survive vary variously, depending on the type of location and geology (hilly, lowland, wet, dry, acid, etc., known as the *terrain*). Survival and visibility also depend on how far the remains of the past have already decayed or been disturbed by later activities, such as cultivation or building. These *site formation processes* give a site its modern character, and this has a strong influence on the excavation method that is used.

Excavation usually (but not always, see below) requires the removal and permanent dispersal of strata so they can never be reexamined. So the method is also influenced by the need to conserve cultural strata as far as possible – never dig more than you need to understand the site. Many sites are situated in socially sensitive areas, where excavation (particularly the removal of skeletal remains) is to be avoided or kept to a minimum.

Successful excavation depends on our ability to see or detect these traces, so that they can be measured and sampled, and this in turn depends on the *techniques* and the skilled workforce available. Like other sciences, excavation requires us to devise new techniques that enable us to see more, so that excavation method is in a state of continual development.

The way an excavation is done is therefore determined by what you want to know, the state of preservation of the site, the techniques and skills available, and the social context of the country in which the excavation takes place. In best practice, these are brought together and balanced in a program specially designed for each project. Contrary to popular belief, success is much less dependent on the application of a standard method (or *default system*) to every situation (Carver 2011).

Key Issues/Current Debates/Future Directions/Examples

Excavation Areas

The type of area opened in an excavation is determined by its purpose. Small-scale excavations, such as *shovel tests* and *test pits* and *trenches*, are used in the reconnaissance stage to locate sites or in the evaluation stage to help assign their current value. Shovel tests are the size of a shovel blade say 15 × 15 cm, test pits are 1 × 1 to 4 × 4 m, and test trenches are 1–3 m wide and can

be very long (100 m or more). They are especially valuable for testing deep strata, since the sides can be held up by shoring, so protecting the excavators from the danger of collapse (Fig. 1).

Sets of test pits and trenches also have a wide application in addressing particular research questions over a wide area. In this case the pits and trenches are distributed over the landscape with a view to obtaining examples (*samples*) of assemblages and local sequences from which an occupation or behavior can be generalized (see Hester et al. 1997, 58–74; and the entry on American Pioneers and Traditions, Fig. 3 in this encyclopedia). *Box excavation* consists of a number of test pits (up to 5 × 5 m in area) set adjacent to each other in a grid, each separated from the other by a *balk* (about half a meter wide) along which excavators can walk and earth be removed. The balk also serves to retain a *section*, a vertical slice of strata, drawn by excavators to record the sequence of layers at that point. Box excavation was pioneered in Russia and adopted in China, and a version was also enthusiastically promoted in England by Mortimer Wheeler (see the entry on British Pioneers and Fieldwork Traditions in this encyclopedia).

Area excavation refers to an excavation where the area opened is continuous (Fig. 2). In research

Excavation Methods in Archaeology, Fig. 1 Excavation through part of the tell settlement at Catal Hoyuk, Turkey, showing edges protected from collapse by sandbags and a deeper trench supported by timber shoring (M. Carver)

Excavation Methods in Archaeology, Fig. 2 Area excavation at Portmahomack, Scotland. The horizon is being exposed by a troweling line and will be recorded with the assistance of observation from a tower (M. Carver)

excavations, the size of the area is closely connected to the questions addressed: early pioneers in Denmark used areas of up to 3 ha to reveal the shallow but extensive traces of Iron Age villages consisting only of pits and postholes. In CRM excavations the size is related to the area to be affected by development; these are often very extensive, such as the Framework Excavations in advance of London's Fifth terminal at Heathrow, or the excavations by the National Road Authority in Ireland (see the entry on Ireland: Investigations in Advance of Motorway Construction in this encyclopedia).

Excavation Techniques

Archaeological strata are defined in the horizontal plane by scraping the surface until boundaries (anomalies) are seen in the soil. These denote the edges of *contexts*, deposits that are made at different times (Fig. 3). The object of excavation is to define contexts and put them in order to produce the story of the site. Initial definition of a deposit is often achieved with a mechanical excavator with a front bucket or backhoe, used for example to remove topsoil or a concrete platform. The surface may then be cleaned with a shovel and further defined with a trowel, a tool which archaeologists have adopted from the building trade (a pointing trowel) and made especially their own (Fig. 4). The ability to define strata and to see objects depends on the technique and the intensity of

Excavation Methods in Archaeology, Fig. 3 The dark curved patterns of post pits and ditches revealed by troweling. On this sandy terrain, the edges are rendered more visible for visible with the aid of a light spray (M. Carver)

effort applied. For example, clearance of the topsoil with a back-actor is fast but visibility is sacrificed – smaller objects and more subtle edges in the soil will not be noticed. By contrast, to ensure that everything is noticed in a feature of

Excavation Methods in Archaeology,
Fig. 4 Trowels in use. (**a**) The pointing trowel favored in Europe. (**b**) The handpick favored in East Asia (M. Carver)

special importance, such as furnished grave, the excavator will proceed with the greatest caution, not only taking care to define every tiny anomaly in the ground, but *screening* (sieving) all the waste soil (*spoil*) to make sure nothing escapes.

These different levels of digging at which excavation may operate also imply the application of different levels of *recording*. For example, the character and location of a wall exposed by a bulldozer will not be as accurately known as one carefully revealed by the trowel and brush. Accordingly, the more detailed the excavation, the more detailed should be the records. It can be seen too, that the more detailed the digging, the

longer it will take and the more it will cost. The question of how much trouble to take is therefore a vital one to consider at the design stage. One useful way of controlling the application of appropriate level of digging and recording is to use *Recovery Levels*, lettered A–F (Fig. 5), a handy template which lays down in advance the minimum recording required for each type of digging. This ensures not only that the full record is made but that features excavated at the same level can be compared: the assemblages of two garbage pits excavated at the same recovery level are comparable, since they were retrieved at the same level of intensity and subjected to the same screening regime.

Recovery levels are decided in the design stage. In general, Level A is used for the clearance of the top of a site by machine: Level B usually refers to tidying with a shovel and Level C to preliminary definition with a trowel. The vast majority of features are excavated at Level D or its equivalent. Here definition is as good as can be achieved by the naked eye, each context is recorded individually, 25% of the spoil is screened, and there are detailed written and photographic records of all features. Level E tends to be applied to features of special importance like an undisturbed floor or a furnished grave. Here the tools used are the dental pick or the scapula, rather than the trowel, and the excavator works very slowly and close to the ground. There will be occasions when a feature is so unusual, and in such good condition, that the excavators cannot do justice to it on site. In this case (Level F) it is boxed and lifted and taken to the laboratory, where it can be slowly dissected in controlled conditions. A pioneering example was the lifting of an entire burial chamber at Högom in Sweden. At Monruz in Switzerland, an Upper Paleolithic floor was defined on site and then lifted and put on permanent display – a combination of Levels E and F excavation.

Nano-Excavation

Recent technical advances have further enlarged the ambitions of excavators to detect, and record in ever more detail, the phenomena encountered on archaeological sites. Archaeologists started screening and taking bags of soil (*context samples*) back to the laboratory since decades ago, in order to extract material that was suspected of being there, but not visible to the naked eye. Examples are grains of pollen or the husks (carcasses) of insects, which give information about the vegetational resources and the local environment, respectively.

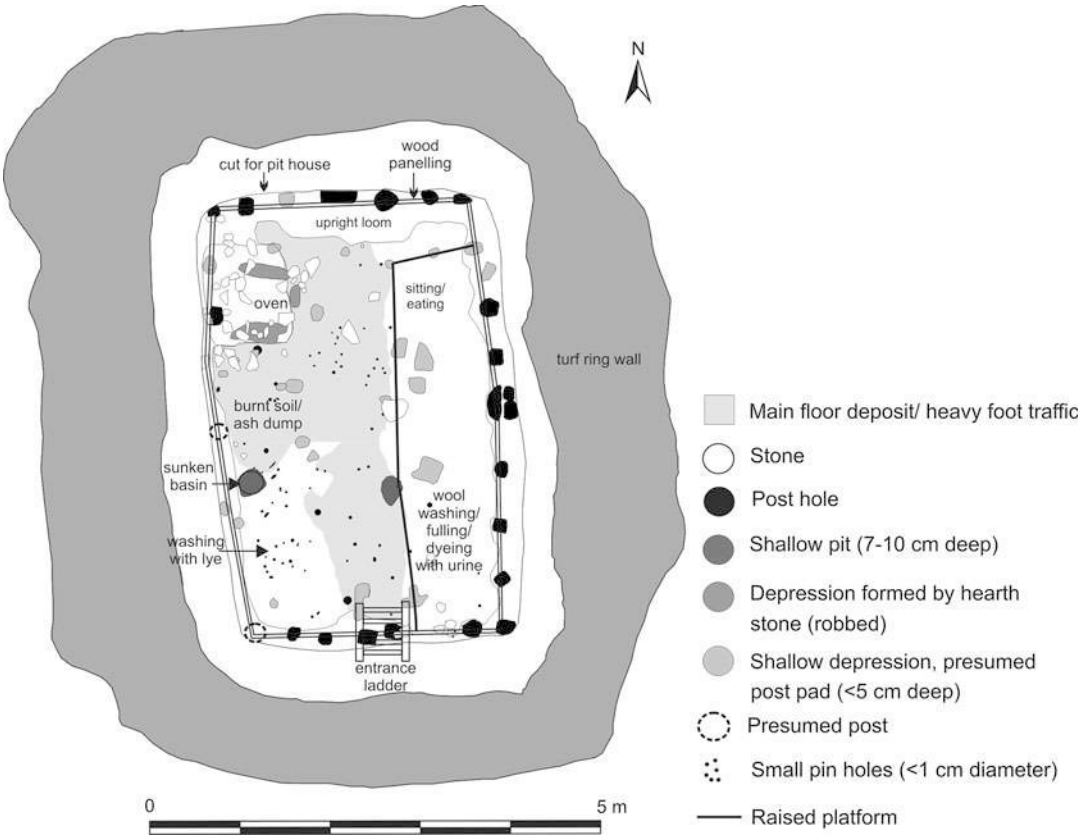
Further developments, which might be termed Level G, use chemical and geophysical readings taken on site, to infer the former presence of certain activities. ICP analysis was used at Sutton Hoo to detect traces of iron and copper from a vanished cauldron and the residue of bones from a burial chamber that had been scoured by tomb robbers. Minute traces of bone can now be identified to species by *proteomics*, using the weight of specific proteins. In Greenland, an archaeological team described 500-year sequence of animal farming, using DNA drawn from a sequence of samples taken from a vertical core driven down into an open field (Hebsgaard et al. 2009). Magnetic instruments have proved revealing on site, for example, at Pinnacle Point where Paleolithic hearths have been detected using magnetic susceptibility measurements. Perhaps the most interesting advances, from the excavators' point of view, are the results of using geophysical and geochemical techniques in combination. An example is Karen Milek's analysis of the floor of Viking houses in Iceland where magnetometer readings and chemical readings allowed her to infer the presence of wool washing, latrines, and beds and map their location (Milek 2006; Fig. 6).

Arbitrary and Stratigraphic Excavation

Since the basic sequence of an archaeological site is given by the contexts (layers), the ideal is to record each of these in the order in which it was deposited. This is *stratigraphic excavation*, which, in its simplest form, maps each layer separately (Roskams 2001) and in more sophisticated schemes records all the layers but also higher-order concepts like features and structures (Carver 2009; and see the entry on Recording in Archaeology in this encyclopedia). The order of deposition may be partially captured in *section* and is worked out for the site as a whole with the aid of *stratification diagrams*.

LEVEL	COMPONENT	FIND	CONTEXT	FEATURE	STRUCTURE	LANDSCAPE	e.g.
A	(not recovered)	Surface finds PLOT 2-D	Inferred by sensor OUTLINE PLAN	Inferred by sensor OUTLINE PLAN	Inferred by sensor OUTLINE PLAN	Inferred by sensor	Field walking
B	(not recovered)	Large finds RECORD EXAMPLES KEEP EXAMPLES	Defined by shovel DESCRIBE	Defined by shovel SHORT DESCRIPTION. OUTLINE PLAN	as features	PLOT STRUCTURES on OS	19th C House
C	(not recovered)	All visible finds. RECORD ALL. KEEP EXAMPLES. MAY PLOT BY m^2	Defined by coarse trowel DESCRIPTION (Munsell for mortars and natural)	Defined by coarse trowel FULL DESCRIPTION. DETAILED PLAN HEIGHT	Defined by coarse trowel EXCAVATE AS ONE. PHOTOGRAPH	1:100 PLAN PROFILE	16th C Pits
D	SAMPLE SIEVING of spoil on site for presence of specified material (spoil not kept)	All visible finds PLOT 3-D and KEEP ALL	Defined by fine trowel DESCRIPTION (Incl. Munsell) PLAN 1:20	Defined by fine trowel FULL DESCRIPTION. DETAILED PLAN 1:20 (colour coded) CONTOURS PHOTOGRAPH (B/W)	Defined by fine trowel EXCAVATE AS ONE. PHOTOGRAPH by PHASE	1:100 PLAN CONTOUR SURVEY	Timber trace building
E	TOTAL SIEVING of spoil on site for presence of specified material and KEEP SPOIL	All visible finds PLOT 3-D and KEEP ALL	Defined minutely DESCRIPTION (Incl. Munsell). PLAN (natural colour) 1:10 or 1:5 contour	Defined minutely FULL DESCRIPTION. PLAN (colour) 1:10 or 1:5 CONTOUR. PHOTOGRAPH	Defined minutely EXCAVATE AS ONE. PHOTOGRAPH by PHASE	(as LEVEL D) CONTOUR SURVEY	Skeleton
F	MICRO SIEVING soil block in laboratory	(as component)	(as LEVEL E) and LIFT AS BLOCK	(as LEVEL E)	(as LEVEL E)	(as LEVEL D)	Storage pit fill

Excavation Methods in Archaeology, Fig. 5 Recovery levels used to control the levels of precision applied to digging and recording in excavation (M. Carver)



Excavation Methods in Archaeology, Fig. 6 An interpretation of Hofstadir pit house G, owed to microchemical and geophysical mapping. (Courtesy of Karen Milek)

Arbitrary excavation divides the deposit into horizontal slices 5–10 cm thick, known as *arbitrary levels* (or spits). This is naturally a much faster method of digging than defining each original cultural layer in three dimensions. It is often justifiable in the case of deposits where stratification is extremely difficult to see, for example, in *cave sites* or *LBK settlements*. Even when layer interfaces are visible, it is sometimes championed as more scientific than the definition of individual contexts, which is subject to the variable skills of excavators. If a deposit is precisely sliced, horizontally and vertically, the records of these surfaces provide an unequivocal, and checkable, account of where interfaces were located and what layers looked like.

Analysis and Publication of Excavations

The minimum duty of every excavator is to conserve the records made in a publically accessible archive (see the entry on Publication in Field Archaeology in this encyclopedia) and provide an account of the sequence of activities encountered on the site. Many thousands of CRM excavations are conducted each year that meet these minimum requirements on behalf of clients. The full yield of research requires a comprehensive program of analysis, in which all the artifacts and biota (the *assemblages*) are studied and the *use of space* is analyzed and the *sequence* and date determined. In general the assemblages indicate the activities on site; the spatial analysis discovers the shape of buildings and how floors, yards, and routes were used. The sequential analysis puts the structures and activities in order and gives them a date. These results are synthesized to give a documented account of the events that occurred in order of date, often divided for convenience into phases or periods. What every excavation should offer is a strong, evidence-based local

story, which can then be deployed to understand bigger questions couched in more generalized theoretical frameworks.

Cross-References

- American Pioneers and Traditions
- British Pioneers and Fieldwork Traditions
- Burial Excavation, Anglo-Saxon
- Publication in Field Archaeology
- Recording in Archaeology
- Soil Pollen Analyses in Environmental Archaeology

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Experiencing Cultural Heritage

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Introduction

The experience of cultural heritage is varied according to the person's realm of experience, the setting of the experience, and the intent of the experience from the point of view of the participator and the provider. The most readily accessible experience of cultural heritage is in the realm of tourism, whereby tourist motivation can be explicitly linked to cultural heritage resources and locations. Notable in European countries, and borne out in global tourism statistics, the cultural heritage tourist has particular motivations, allied to education and cultural improvement, is looking for authentic experiences of cultural traits allied to distinct geographic locations, visits particular sites, spends more at a location in both time/duration, and money/investment in the leisure activity. Figures produced by other national tourism organizations (NTOs) around the globe tend to concur with this trend too: Experience of cultural heritage is a popular leisure motivation on an international scale as well as a local driver for economic and social development.

Definition

Heritage tourists can be readily identified in demographic studies of leisure activities, and for tourism, businesses are a sought-after group who will often act as repeat visitors to an area. Heritage tourists can therefore be categorized as a sector of the visitor population who desire to engage in and respond to an immersive experience associated with *genius loci*, or the "spirit of place," comprising all aspects of the built, natural, cultural, and social environment. Studies in tourism management which have created typologies of visitor according to motivation and behavior continue to subdivide and refine the form of the heritage tourist, according to specialized area of business/activity focus, but the general principle of this type of tourist can be understood distinctly alongside categories such as cultural tourist, or ecotourist. Associated variables in the types of tourist and form of encounter can be analyzed by the origin of the visitor, local, domestic, or overseas; the duration of stay, as a day visit or longer; and by the visitor context, staying with friends or relatives, within a family group, or on business.

The different types of tourist unsurprisingly take part in different types of heritage tourism,

and the form of experience is molded by where the encounter with cultural heritage takes place. The most readily understood and studied form of heritage experience can be found at sites operated as visitor attraction. It should be remembered that many sites operated as heritage visitor attractions were not designed for the purpose of tourism (e.g., castles, country houses, and battlefields), and therefore can be argued to provide the most accessible authentic form of encounter, albeit requiring further interpretation for visitors through guidebooks, display materials, and other visitor service functions. The further major locations for a definable cultural heritage experience can occur within a museum or gallery, which display specific aspects of a community's history or types of artform, and the function, form and operation of museums and galleries have a well-established literature and philosophy of museology (Bennett 1995). Recognition of the cultural heritage aspects of the wider tourism environment beyond the defined site or building is seen through increasing prominence of heritage-themed events (associated with folk customs, historical or geographical traditions, and established calendar events); wider forms of "heritage" hospitality via distinct types of food and beverage (regional or historical foodstuffs), or locations for visitors to stay, such as historic buildings converted into self-catering accommodation or hotels. Broader cultural experiences, allied to the wider tourism field of cultural tourism, can also have distinct characteristics allied to cultural heritage, and the resurgence of the civic trust or main street movement in Europe and North America capitalizes on areas of towns expressing their historic/cultural character to attract visitors, and support regeneration of local economies. The growth in interpretative technologies deployed in the tourism field, as part of the overall marketing and visitor strategy for a location, provides a newly distinct facet of the cultural heritage experience, with "apps" and websites developing rapidly to provide rich content and information about pin-pointed historic locations, and additional layers of encounter which reach beyond the site itself.

The actual encounter with cultural heritage is itself obviously an intensely personal experience, and study within the fields of tourism studies draw readily on psychological and psychogeographic technique, allowing the ontology of the encounter to be closely analyzed. The experience of cultural heritage is thus deeply influenced by personal and cultural psychologies (education, upbringing, religion, culture, personal association, interests and so on); extraneous experiential factors (location; symbols, aesthetics, societal behaviors); and practical physical factors (such as site operations; visitor management; interpretative engagement). The visitor journey to and encounter of cultural heritage has come to be recognized as a complex set of circumstances, and ever more so when understood within what American business academics Pine and Gilmour (1998) believe to be the growth of the "experience economy." This work has significantly influenced tourism studies' approach to studying the visitor experience, noting that forms of behavior, communication and interpretation, and transaction change over time as the level of sophistication in the management of the visitor experience increases.

Key Issues/Current Debates/Future Directions/Examples

Worth noting in the cultural heritage experience is the level of implicit and explicit communication between the managers "staging" the experience and the receivers or participants in the encounter. Heritage, as considered elsewhere, can be heavily laden with political and social resonance, and the visitor experience may also be influenced from the point of view of educational, cultural, political, or environmental message. This has been most readily studied within the museological field, but is also significant in areas such as World Heritage Site designation, the interplay of environmental protection and heritage preservation seen in the work of the varied National Trusts in different parts of the world, and Governmental heritage agencies with education as a part of their strategic mission. The range of locations where an encounter can occur, and the ambient environment for that encounter, be it a sense of place, a distinct historic location, or an activity explicitly

associated with tangible or, indeed, intangible expression of cultural heritage, means that the experience is a rich field of study. This has led to a welcome growth in academic study and critique from different subject origins, such as geography, archaeology, and business management and tourism. A strong publication stream is developing in journals such as *the Journal of Heritage Tourism; the International Journal of Heritage Studies; and the Journal of Public Archaeology*, among others.

The practicalities of the visitor experience of cultural heritage are important considerations in the management of the built environment in locations wanting to attract tourism more generally. Cultural heritage plays a distinct role in the development of the tourist destination image (TDI) of a location, and even entire country: Scotland is a good example of this, where an interesting juxtaposition is navigated between the country's tourism infrastructure development requiring to be competitive and by necessity up-to-date, and at the same time incorporating the key tourism attractiveness factors of iconic historic sites and culture (Edinburgh Castle, bagpipes, tartan, and whisky being the recognized stereotypical heritage symbols). At a city-scale, a similar tension can be seen playing out in the visitor management within the city of Venice, balancing very practical conservation pressures on the built environment, and the increasing tourist demand, leading to sometimes drastic management measures of capacity management when the pressure on numbers gets too high for facilities to cope in peak season. Equally, the "Outstanding Universal Values" (OUV) of World Heritage Sites represented through monumental sites such as the Great Wall of China, or wider cultural landscapes such as the recently inscribed World Heritage Coffee Cultural Landscape of Colombia can iconically represent a nation's cultural wealth and by consequence its attractiveness to tourists through the location's TDI.

The experience of cultural heritage will continue to develop in complexity, as the types of transaction and encounter with forms of tangible, intangible, and technological representations and interpretations of heritage increase. Leask (2010) provides the best recent account of the state of research into the management of visitor attractions, noting that many of those management aspects are intimately tied into the effective production and enhancement of the visitor experience. The use of cultural heritage as a factor in leisure and tourism activity, as well as a context for the management and development of the built and natural environment will also increase the pressure on cultural heritage advocates and protectors – and the tension between heritage and development in its broadest sense will lead to ever more complex debates in divergent situations around the world. Equally, the opportunity for a visitor to encounter rich cultural heritage experiences may be a positive tool for intercultural dialogue.

Cross-References

- ▶ Authenticity and the Manufacture of Heritage
- ▶ Cultural Heritage and the Public
- ▶ Cultural Heritage Management: Business Aspects
- ▶ Heritage Research and Visitor Planning
- ▶ Tourism, Archaeology, and Ethics: A Case Study in the Rupununi Region of Guyana

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Experimental Maritime Archaeology

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Introduction and Definition

Experimental archaeology has been variously defined, early examples being Ascher (1961) and Coles (1966). Broadly, one may say that experimental archaeology involves recreating material aspects of technology or modes of production of the past, based on archaeological and historical evidence. If the experiment is based on good evidence and is conscientiously conducted, it will likely increase our understanding of the technology investigated.

Maritime or nautical experimental archaeology usually involves building and sailing a replica or recreation of a ship or boat of the past. Experimental maritime archaeology can be seen as having started in Spain when the impending 1892 quatro-centenary of Columbus's first voyage to the Americas prompted the construction of a Columbus ship reconstruction. In 1893 a replica Gokstad ship built in Norway was sailed across the Atlantic to the Exposition at Chicago. Neither of these projects was explicitly experimental archaeology and the term had not yet been coined.

Key Issues/Current Debates/Future Directions/Examples

A notable attempt to formulate "right principles and methods" of experimental ship and boat archaeology was made in Coates et al. (1995). The ten authors clearly had a range of opinions, and while some sections impose a rigid scheme analogous to scientific laboratory experimentation with data collection, formulating a hypothesis, testing the hypothesis, presenting the whole process for criticism, and finally reassessment, there is acknowledgement that the hypothesis will "almost invariably fail to comprehend the whole extent of the matter in question." Watercraft, in the interplay of their construction and the dynamic environments in which they operate, are very complex artifacts. Coates et al. (1995) provide a good overview of how nautical experimental archaeology should be done. They note the need for careful and rigorous work, good recording, involvement of wide interdisciplinary expertise, and the proper publication of aims, hypotheses, methods, and results. But this is true of archaeology and other academic work in general. Some sense of differing attitudes to theory and philosophy can be gained from the published transcripts of discussions at The International Ship Replica Seminar, Roskilde 1984 (Crumlin-Pedersen and Vinner 1986).

Experimental archaeology is often interesting to the public and the media. The recreation of ships and boats of the past and recreation of voyaging has considerable romantic appeal. As a form of purely academic research, it is expensive and time-consuming, but replica ships and boats are funded and created for reasons other than pure academic research, including the enhancement of national identity and prestige. Academics should work with such projects and aim for maximum practicable authenticity.

A distinction between replica watercraft and reconstructions of watercraft is useful. A replica, as defined by Fenwick (1993), is only possible where shipwreck archaeology provides near complete data about the design of a vessel from a substantially intact shipwreck or there are good archived records of the design. Replicas built from shipwreck data include the Kyrenia ship (third century BCE) (Katzev 1987) and the several replicas based on the Viking ships at Skuldev (eleventh century CE). The *Endeavour* replica was built on the basis of the plans of James Cook's most famous ship which were drawn when the ship was purchased by the Royal Navy

and converted for exploration. The *Endeavour* replica was not conceived as experimental archaeology and only recently has been published as experimental archaeology (MacArthur 2009), but the ship, now owned by the Australian National Maritime Museum, could be used for programs of experimental archaeology. All replicas involve some conjecture because the archaeological and historical data are never completely comprehensive. The several recreations of Columbus's ships are examples of "reconstructions." The designers have attempted to reconstruct the design of typical Spanish vessels c. 1490 because data about Columbus's ships is limited to the ship types (e.g., *caravela redonda*) and some indication of the sizes. The Columbus ship reconstructions have served to demonstrate our imperfect understanding of the original designs because the reconstruction ships have been unable to average more than about half the speed under sail that Columbus achieved.

Scandinavian experimental maritime archaeology is widely regarded as the best. There is an excellent resource of shipwreck archaeology of substantially intact vessels from the Viking period and later, and there has been rigorous determination to recreate the appropriate tools and woodworking techniques, particularly by the Danish National Museum's Institute for Maritime Archaeology at the Viking Ship Museum at Roskilde, Denmark, under the leadership of the late Ole Crumlin-Pedersen. A Viking replica vessel made from cleft (split) oak logs is very much stronger than a replica made from sawn planks. Indeed, the light and flexible structure of Viking ships is only possible with cleft planks (Johansen 2009). The most spectacular of the Roskilde-Skuldev Viking replica ships is the 30 m longship *Sea Stallion from Glendalough*, launched in 2004. She was sailed to Dublin and back to Denmark in 2007–2008 making nearly 14 knots at best (Johansen 2009, http://www.vikingeskibsmuseet.dk/en/the-sea-stallion-past-and-present/).

It might be argued that the experimental archaeology based on replica watercraft is potentially more valid than that based on reconstructions. However, reconstruction watercraft – "floating hypotheses" as Sean McGrail (2009) has called them – can be used to test important hypotheses and even resolve important questions. Two or three centuries of debate as to how classical era triremes were propelled were effectively resolved by the Hellas reconstruction. It had long been argued that the geometry of three separate banks of oars at different levels and of different lengths was impracticable to the point of impossibility; that triremes were propelled like more recent galleys with three men to each oar but a single bank of oars. The Hellas replica has demonstrated that three banks of oars can be arranged to provide functional and effective propulsion for an entirely plausible warship design (Rankov 2009).

The construction of the "Duyfken replica," a reconstruction of a Dutch *jacht* of appropriate date (early seventeenth century) and size, was an opportunity to test the practicality and effectiveness of the Dutch system of plank-first construction. The idea that the European age of discovery and subsequent domination of much of the world's maritime trade was made possible, in part, by the switch to frame-first construction of ships is undermined by the Dutch retention of plank-first construction at a time when Dutch shipping was superior to that of the rest of Europe in terms of tonnage, volume of cargoes carried, and successful execution of the long voyages to and from East Asia. The Duyfken replica has made long voyages demonstrating maneuverable and seaworthy performance.

Cross-References

- ▶ Crumlin-Pedersen, Ole
- ▶ Maritime Iconography
- ▶ McGrail, Seán
- ▶ Ship Archaeology
- ▶ Steffy, J. Richard

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Extreme Environments Archaeology: Climate

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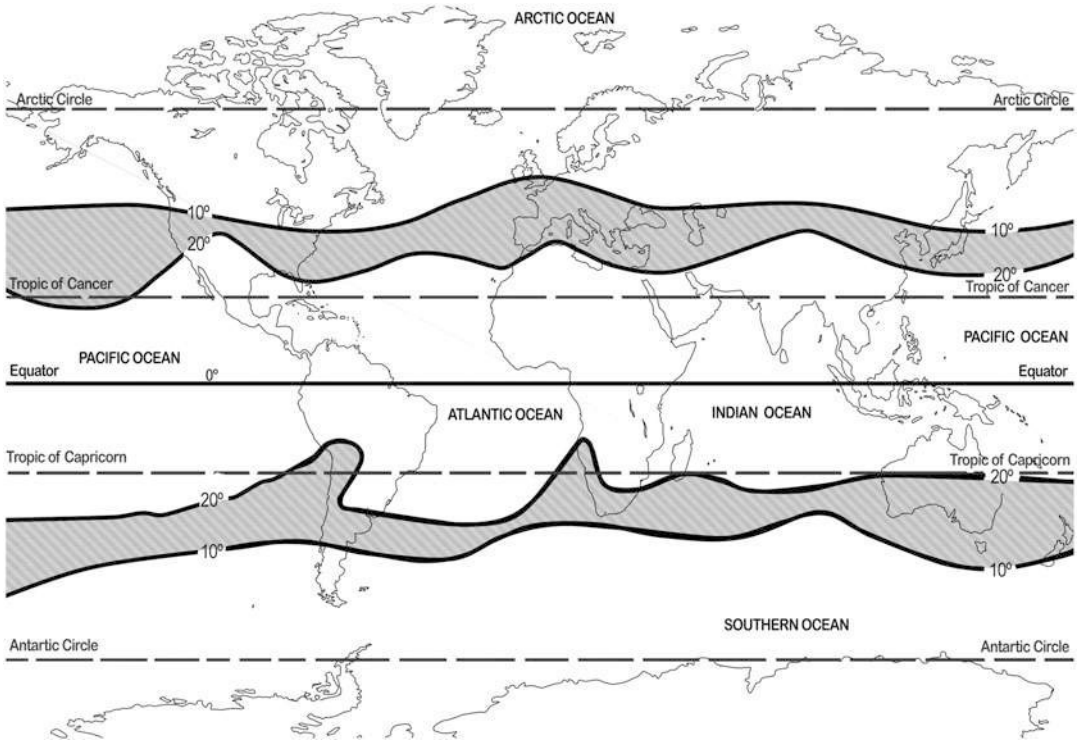
Introduction

There is no complete agreement on how to define an extreme environment. The term is frequently used for any setting that exhibits life conditions unfavorable or fatal to certain organisms with respect to its physicochemical properties. Major classes of extreme environments include acidic (pH $<$ 5), alkaline (pH $>$ 9), hypersaline (salinity $>$35%), pressurized ($>$0.1 MPa), hot ($>$40 °C), cold ($<$5 °C), dry (aw $<$ 0.80), and high-radiation environments (Thiel 2011). They can be natural and/or artificial, permanent, episodic, or temporary. Hence, an environment could be extreme or not, depending on the organism implied and the physical boundaries within which they can thrive. Since humans are terrestrial, subtropical, air-breathing, low-altitude homeotherms (Cotter and Tipton 2014), most of the world represents a challenge for us. Given that 2/3 of the world is covered by oceans and humans are not biologically aquatic animals, we have to focus on the remnant terrestrial third to find out our ideal environment. If in that third, we look for climate and topography temperate enough for the kind of subtropical primate we are, we will keep only one-sixth of the planet (Piantadosi 2003). This leaves us with a narrow part (see shadowed area in Fig. 1). Consequently, it is logical to think that we humans had to overcome our limitations, if not by natural means at least by cultural ones, in order to multiply and prosper. Cultural adaptations, ultimately, allowed us to inhabit not only extreme climate regions but also, more recently and for limited amount of time, even the outer space. Having acknowledged the wide variety of extreme environments that exist, in the rest of this article, we will deal only with arid, cold, and high-altitude environments. Also just as climatic extremes can be spatial, they can also be temporal. In this latter case, we speak of extreme events. They include droughts, floods, wet periods, warm periods, cool periods, and high-variance periods. But since they are unpredicted and there are no widespread conventions for how these events are defined, we will not refer to these events in this entry (but check cross-references for more on this subject).

Definition

The range of body temperatures compatible with human life is relatively narrow and contrasts with the wide climatic variability that the Earth shows. The first quantitative classification of world climates was elaborated by Wladimir Köppen. As a plant physiologist, he had differentiated five vegetation groups including plants of the equatorial zone (A), the arid zone (B), the warm temperate zone (C), the snow zone (D), and the



Extreme Environments Archaeology: Climate, Fig. 1 World map with the area between the isotherms of 10 °C and 20 °C shadowed. Credit: Ana Fondebrider

polar zone (E). A second letter in the classification considers the precipitation and a third letter the temperature (e.g., Dfc for snow, fully humid with cool summer; see Kottek et al. 2006). Hence, there exist at least 31 types of climates (Kottek et al. 2006).

As said above, extreme is a relative term but habitats are multidimensional. Hence while some habitats could be considered extreme in terms of mean temperature, they can have other features judged to be favorable. For instance, if we consider as extreme climate the ones in which the mean annual temperature is either less than 10 °C or above 20 °C (not shadowed area in Fig. 1), we can see that most of the world falls under this category. Nevertheless altitude, topography, precipitation, latitude, continentality, and oceanity are factors that should be contemplated. In that sense, other measures such as effective temperature, a concept designed by Bailey (1960) that Binford (1980, 2001) has utilized as an operational definition of growing season, could be a more synthetic way of establishing extreme environments.

Historical Background

From the nineteenth century on, we can consider that archaeology has been established as a discipline. Since its onset, climate was important in its development. First, the direct experience of climate during fieldwork suggested to the first archaeologists the importance of climate in human life, past and present. But also, climate began to be part of different theoretical frameworks, which considered it as conditioning or even determinant. After World War II, recognition of the environmental effects increased, and archaeologists were of the first to provide evidence of environmental disasters generated by humans that ultimately led to abandonment of sites or the collapse of political systems (Dean 2015). Possibly this awareness allowed Julian Steward's ecological perspective to emerge. Steward

(1955) advocated that anthropologists should understand each culture in its ecological context, giving rise to cultural ecology (Dean 2015). Since then, climate change has been proposed as one of the prime movers for explaining social change. Cultural ecology eventually influenced processual archaeology, the dominant theoretical movement of the 1960s and 1970s in the USA. One of its founders, Lewis Binford, in his monumental analysis of hunter-gatherer behaviors in a global scale, defined environmental variables as his frame of reference (Binford 2001: 50).

Also it should be noticed that environment and climate have been related with the level of complexity that certain societies could achieve. For instance, Diamond (1997) has proposed that societies developed in a different way on different continents because environmental differences. Complex societies could emerge only in dense sedentary populations capable of accumulating food surpluses, and they depended on the rise of agriculture for doing so. But domesticable wild plant and animal species were distributed very unevenly and concentrated in only nine areas of the globe, which thus became the earliest homelands of agriculture (Diamond 1997: 100). Some of those homelands are located in what we can consider arid (and hence extreme) regions (see below).

Given the importance of climate for archaeological theory in general, it is strange that extreme climates did not achieve special attention until very recently. In the review volume of *American Antiquity* in which a group of archaeologists identified the 25 grand challenges that archaeology has to face, among them figured how do humans occupy extreme environments and what cultural and biological adaptations emerge as a result (Kintigh et al. 2014). This means that although certain international efforts are beginning to gain momentum (see below), the archaeology of extreme environments is still rising.

Key Issues/Current Debates

Arid Environments

Aridity could be defined as a deficit of moisture in the environment. But aridity is a complex concept, and its environmental manifestations vary from place to place and through time. Although aridity is equated normally with deserts (defined as an area with a moisture deficit where rainfall is less than 20% of potential moisture loss through evaporation; see Smith et al. 2005), there is a great diversity within, and between, arid environments going far beyond deserts (Thomas 2011: 3).

Deserts cover around 25,500,000 km^2, approximately 20% of the terrestrial world, being present in both Northern and Southern Hemispheres. They present patchy, variable, and frequently unpredictable resources. Therefore, patches where water is available are key to human exploitation, providing access to the arid hinterland and means of traversing the land like navigating through "islands on the sea" (cf. Veth 1993). For humans, arid environments could be areas to avoid, but they are also environments that can be successfully exploited. Lack of surface water, limited food, and climatic extremes have generally made think that arid areas are unfavorable places for habitation, though hunter-gatherer and pastoral-nomadic peoples, living at low population densities, managed to thrive there (Thomas 2011).

Archaeological evidence indicates that people have a long presence in African deserts. Early Stone Age or Acheulian sites are reported from the Namib, Kalahari, and the eastern Sahara, but it is not clear whether this reflects exploitation of certain patches within an arid environment or whether these areas were semiarid savannas at that time (Smith et al. 2005). In Australia, the most arid continent ever occupied by humans (Veth et al. 2015), groups entered Sahul c. 50,000 years ago in favorable conditions. In what has been labeled the "desert transformation model," groups first adapted to more benign climates and, given shifting conditions, have to made changes in their settlement behavior, technology, economy, etc. (Veth et al. 2015). Prehistoric population grew slowly until the Last Glacial Maximum, when evidences of abandonment of large parts of the arid interior, population decline, and surviving populations retreating at refugia are recorded (Veth et al. 2015). By the time Europeans arrived in Australia, the deserts were more densely packed, a process that, in

the late Holocene, produced the desert societies known by early ethnographers (Veth et al. 2015).

In the Americas, human exploration and colonization of deserts occurred very early in terms of its peopling: either in South (around 12,000 years BP; see Borrero 2015) and in North America (around 11,000 BP although settlement probably did not occur until early Archaic; see Smith et al. 2005).

Arid regions of the world have a special role in human evolution. They have funneled early human dispersal, representing alternatively barriers or corridors (Smith et al. 2005). Some of them, showing more favorable conditions, had allowed the domestication of plants and animals (cf. Diamond 1997). And also studies of desert societies have provided the most fertile debates about human adaptability, how societies cope with extreme environments, and their effects on human land use, mobility, and dispersal (Smith et al. 2005).

Cold Environments

Humans tolerate cold quite poorly compared to other mammals. Survival in the cold is limited primarily by hypothermia, defined by a core temperature of less than 35 °C (95 °F) when body's defenses against cold (shivering and constriction of blood vessels) reach maximal response. If the body cools further, at 30 °C (86 °F), shivering ceases, and at 27–29 °C (80–85 °F), coma occurs. Hence, people can only survive in cooler climates by behavioral adaptations, which include wearing clothing, building shelters, and maintaining sources of external heat (Piantadosi 2003).

Since the first use of fire, dated as early as 800,000 years ago (Walker et al. 2016), people have regulated the temperatures of their dwellings. While fire and shelter facilitated hominin presence in cooler climates, only the use of clothes, an efficient and flexible strategy to stay warm, could sustain occupation of cold climates (Gilligan 2016). There is archaeological evidence indicating that hominins began to use simple clothes (animal skins and furs) by Middle Pleistocene. Scrapers to work hides became more frequent in middle latitudes as hominins occupied colder environments from 400,000 years ago (Gilligan 2016). These northern and colder areas were abandoned during the peak of the Last Glacial Maximum (LGM, 20,000–18,000 years ago). But only the development of complex clothes (fitted garments with the option of multiple layers, Gilligan 2016) allowed the occupation of the Arctic. Complex clothes required new tools such as stone blades, bone awls, and bone-eyed needles developed first in Africa during a cold phase (75,000–60,000 years ago; Gilligan 2016). These tools and clothes accompanied modern humans when they spread into northern Eurasia (45,000–25,000 years ago) and explored Siberia during the climatic amelioration following LGM (Rogers and Anichtchenko 2015). Complex clothing gave to *Homo sapiens* an advantage over Neanderthals (whose scraper-dominated toolkits suggest they had only simple clothes, Gilligan 2007) and finally, along with technologies related with maritime subsistence such as skin boats and toggling harpoons (Rogers and Anichtchenko 2015), facilitated the occupation of the Arctic.

In the Americas, the oldest archaeological sites in Alaska date to c. 15,000 BP, and by c. 4500 BP, Paleo-Eskimo peoples had settled in North Greenland (Rogers and Anichtchenko 2015). The most recent human occupation of extreme cold climate was that of the Antarctica which occurred very recently (since all Antarctic archaeology is historical archaeology) being brief, infrequent, and scattered (Pearson and Senatore 2015).

High-Altitude Environments

High-altitude environments are defined as those at and over 2500 m above sea level (Aldenderfer 2015). It has been estimated that 150 million people live permanently at high altitude. Most of these permanent high-altitude residents live in the Andes between 2700 and 4500 (9000 and 15,000 ft; Piantadosi 2003). Physiological adaptation to hypoxia (low oxygen density) was critical for the establishment of permanent habitation at elevations above 2500 m. This adaptation (based upon selection for alleles identified as promoting improved oxygen transport) probably took some time in developing (Aldenderfer 2015) acting as a constraint on the earliest inhabitants of these environments. Also at

high elevations, even in tropical mountains, cold is a constant problem (see above). The combination of cold, hypoxia, and aridity creates a context of low primary productivity in which high-altitude inhabitants has to survive (Aldenderfer 2015).

Although evidence for the occupation of high-altitude environments is relatively recent in human history, it is possible that some of our hominid ancestors may have used zones above 2500 masl (as the southern margin of the Ethiopian plateau) as early as 1.5 mya (Aldenderfer 2015).

In South America, highland occupation appears after 10,500 BP, a very early occupation taking into account South American peopling (although there is controversial evidence of earlier sites; see Dillehay 2000; Aldenderfer 2015). It was initiated by foragers moving from low-elevation sites into the Andean highlands to procure resources such as obsidian and animals (Aldenderfer 2015). Some of the high-altitude environments of the Puna of the South-Central Andes witnessed the early Holocene process of domestication of camelids (Yacobaccio 2007; Mengoni Goñalons 2008), a process related with year-round occupations (Borrero 2015). Aschero (2000) suggested that Puna occupation may have optimized the use of resources from Puna (highlands), *quebradas* (canyons) and valleys located at different altitudes. Resources from valleys and forests were recorded in various archaeological Puna sites, in spite of the lack of sites in those areas where these resources came from (Aschero 2000).

In Asia, although there has been speculation that the Tibetan Plateau was occupied as early as 50,000 years ago, more recent research suggests that it is no earlier than 30,000 years ago and could be much later in time (Aldenderfer 2015; Borrero 2015).

Hence, although it is probable that humans made seasonal forays into high-elevation environments perhaps from the Lower Paleolithic, the permanent occupation of high-elevation environments occurred relatively late. The adoption and spread of plant and animal cultigens, along with acquired genetic adaptations, allowed high-elevation inhabitants to create complex polities (Aldenderfer 2015).

International Perspectives

As extreme environments are distributed all over the world, they have been archaeologically researched in different countries, but they have not been considered in a global scale. Some efforts are conveyed right now in order to amend this need.

At the Southern Hemisphere, the Southern Deserts Conference has given a new impulse to desert archaeology. It is an interdisciplinary meeting that promotes a comparative perspective on the Quaternary evolution of desert landscapes and peoples from the Southern Hemisphere (Oceania, Africa, and South America). It proposes a fluid dialogue between paleoecology, geology, and archaeology. Four successful conferences had been held: Canberra (Australia, 2003), Arica (Chile, 2005) Kalahari (South Africa, 2008), and Uco Valley (Argentina 2014). Also the ICOMOS International Polar Heritage Committee had very recently constituted a Polar Archaeology Working Group which held its first meeting at 2017.The purpose of the PAWG is to work toward developing and delivering a set of principles for polar archaeology, with best practice guidelines to subsequently be developed. Finally archaeologist Brian Stewart is working to develop a comparative focus group on high-altitude archaeology. Hopefully, in the future, more international-scale efforts directed to extreme environments will be developed.

Future Directions

The archeology of extreme environments is still in early stages of development, probably because of the challenges that extreme climate-related environments posed to archaeology. Technical advances, as new and cheaper means of transports and even drones, should facilitate fieldwork. But in some countries, to afford these new technologies makes climate-related extreme environment archaeology prohibiting. More international conferences and networks are needed to overcome the research challenges of unequal national research funding. Archaeological research in extreme environments

offers the opportunity to test theories of cultural adaptation at the limits of viability. Its need is evident, and today we have the best conditions ever to accomplish it.

Cross-References

- ▶ Altitude Environments in Archaeology
- ▶ Antarctica: Historical Archaeology
- ▶ Arctic Ocean and Bering Sea: Maritime Archaeology
- ▶ Australian Deserts: Extreme Environments in Archaeology
- ▶ Extreme Environments in Archaeology: Disaster
- ▶ Frozen Conditions: Preservation and Excavation
- ▶ Glacial Advances in Asia, Europe, and North America
- ▶ Glacial Landscapes: Environmental Archaeology
- ▶ Greenland, Archaeology of
- ▶ Greenland: Approaches to Historical Norse Archaeology
- ▶ Polar Expeditions (South) in Archaeology
- ▶ Polar Exploration Archaeology (North)
- ▶ Puna, Archaeology of
- ▶ Scandinavia/Northern Europe: Historical Archaeology
- ▶ Tibetan Plateau, Archaeology of

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Extreme Environments in Archaeology: Disaster

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Introduction

Historically, the so-called "natural disasters" have been considered an important study object among archaeologists, such as the case of the renowned localities of Pompeii and Herculaneum (Italy), excavated since the eighteenth century. However, the explanation of the disaster has increased throughout the twentieth century, since it has been invoked as the cause of various social transformations, especially because of their effects on complex societies (Sheets 1980; Buren 2001). Currently, it is also claimed that natural hazards and disasters are among the great challenges of twenty-first century archaeology by the growing interest on this issue (Kintigh et al. 2014; d'Alpoim Guedes et al. 2016).

However, it is noteworthy that archaeology does not have yet a complete documentation regarding localities, theoretical and methodological approaches, or disciplinary collaborative agreements. Unlike what it has been done from the anthropological and historical perspective (Brown 2017), where various natural phenomena have been documented in a long chronology, such as: El Niño/La Niña events; droughts, hurricanes, earthquakes, floods, vulcanisms, among others. The aim of this work is reviewing the protocols for the study of disasters from an archaeological perspective and the impulse that has received from other disciplines, for its characterization and explanation.

Definition: The Disaster Is Social and the Phenomenon Is Natural

Human populations on the planet have colonized and occupied a diversity of environments, from the tundra and the desert to the tropical forests, arising a large diversity of economies going from the hunter-gatherers to the most sophisticated urban populations. All of this produces a great cultural diversity and generate a myriad of attitudes toward to nature (Ramos Roca and Corona 2017; Cooper and Sheets 2012). Then, in human and nature relationships, nothing is static, everything is constantly changing, but also some aspects have persistence. The relationship that societies establish with nature is seen at the same time as an ideological perspective, material reality, and scenario of human activity, where is an increased concern about the dangers of sudden environmental changes or the presence of episodic events that affect them (Arnold 1996; Cooper and Sheets 2012). A central element in the analysis of these phenomena is the tension that exists between the natural and the cultural, since this defines the role of each of them in the social construction of risk, in the accumulation of vulnerability or in the disaster itself. Natural phenomena are described according to the scale of affectation, the location and its area of influence. That is, they can be classified according to their etiology, but also by their scale, in episodic and short- or long-term events (Cooper and Sheets 2012; García Acosta 2005).

Because of its scale, short-term events are related to changes in climate and seasonality, but also to biological events, such as pests and epidemics, would also be located; while the long-term ones are linked mainly to temperature, such as changes in marine currents that affect climate (El Niño/La Niña event), desertification, and environmental erosion, among others. On all of them, societies tend to adapt, but also affect the soils, flora, and fauna, sometimes irreversibly, so that

can lead to profound changes in populations and societies, which also increases the risk survival. Others are episodic, high-energy events that affect landscapes and human populations, such as: volcanism, earthquakes, hurricanes, droughts, frosts, uncontrolled fires, and floods. Finally, another category of dangers may be related to a natural event, but they are more linked to management from the social sphere, such as famines, arson, and social conflicts, including war, which increase both levels of human mortality, as well as those of environmental impact (Cooper and Sheets 2012).

This type of studies considers two premises: societies are not passive recipients of a phenomenon or natural event, therefore, the interaction between society and phenomenon must be considered, characterizing each of them specifically. The episode or incidence of an adverse natural phenomenon is accompanied by other social, political, economic, and cultural facts, which must be assessed to understand the phenomenon and its context, determining its scope, results, and consequences.

For archaeology, that usually has incomplete and interpretative evidence, it can start from the basic proposal to characterize a disaster, which is summarized in Table 1.

Natural events can be triggers of a disaster or are threats when they are considered risk agents, based on the probability that it manifests itself in a period of time and in a specific site. Therefore, a risk equation must integrate both the threat and vulnerability, understood as the inability of a human community to respond adequately to the phenomenon. Consequently, disaster, although linked to a natural phenomenon, has a character and a social definition, which must be explored and understood as a whole (Torrence and Grattan 2002; García Acosta 2005).

Extreme Environments in Archaeology: Disaster, Table 1 Basic characteristics of natural disasters (after Shimoyama in Torrence and Grattan 2002)

Characteristics	Definition
Initiation	The original process or event that set the scene for the disaster, e.g., extreme natural events such as volcano, flood, earthquake, and tsunami
Immediate causes	Specific aspects of the event, which have direct effects on human life and property
Local conditions	Natural and sociocultural variables that establish the local setting at the time of the event
Damages	Concrete negative effects
Assessment	Process in which victims and observers assess the extent and repercussions of the damages
Actions	Acts carried out following the disaster. These include both short-term actions, such as abandonment and cleaning up, etc., and long-term adaptations, such as moving to a new area, collapse of social system, institution of preventive measures, adoption of ritual practices to avoid further occurrence of disasters, etc.

Historical Background: Key Issues/ Current

Although studies on natural phenomena have been recurrent in geography, geology, and other physicochemical and natural disciplines, they considered the societies as passive elements facing the power of nature. In the 1980s, the "alternative model" emerged (Maskrey 1993), which represented the most important effort made up to the moment, in order to integrate a social theory about disasters. This was the first text that systematically presented a radical and integral critique of the dominant physicalist paradigm. Hewitt's essay was decisive in locating vulnerability, not only as a feature of different threats but, above all, originated by economic, political, and social processes (Buren 2001).

From this, we know, but do not follows, the perspective that addresses the archeology of the disaster, such as that dealing with the urgent requirements of identification of victims and research scenarios, after mass death events, since they were considered more linked to forensic processes (Gould 2013; Harrison 2016).

From the anthropology, it was observed then that there are disasters with a long-term development, those that are manifested after a sustained cultural use of the environment, produced by the population growth and the landscape modification, where some cases are: the urbanization

processes, the impact of the infrastructure, the systems of social organization, all of them inserted in the relation of the societies with the environment. At the beginning, researchers proposed that disasters were "natural" and privileged their study in "high-risk societies," establishing an equation, where the disaster is equal to the risk of occurrence of a phenomenon due to the vulnerability of the affected society. Currently, the concept of risk and its management are linked, so that the disaster is definitely located in the social sphere, which are influenced as much by the threats, i.e., the physical events that may happen, as well as for vulnerability (Maskrey 1993).

In the 1990s, there is the "vulnerability approach" or "vulnerability paradigm," which makes the analysis of disasters explicit from the perspective of the families and human communities involved. Then, the historical evidence shows that the risk and disaster are multidimensional and multifactorial processes, which is the result from the association between threats from natural phenomena and certain conditions of vulnerability, which are built and reconstructed over time (Blaikie et al. 1994).

From an archaeological perspective, then it must be considered that natural phenomena have an important role as a trigger of a disaster, but they are not the cause. This is of multiple nature and is found more in the socioeconomic and environmental characteristics of the impacted region (Van Buren 2001; Campos Goenaga 2016; Cooper and Sheets 2012).

Debates

The study of disasters and natural phenomena is in principle multidisciplinary, involving fields, such as meteorology, geology, and geography, and includes social sciences, such as anthropology and psychology, but up to the end of the twentieth century, they did not have a paradigm in common and each one emphasized some particular natural, social or cultural aspects. Buren (2001) highlights that geography was one of the disciplines where disaster research was developed and of great influence in archaeology, for the emphasis on human populations; however, it had a greater biases and funding towards the technological and physical science aspects, in general, aspects that are related to the economic-industrial impact that these activities could generate, an were debated at these time (Buren 2001).

Perhaps the most complicated issue is how archaeology could characterize and explain the disaster from a social perspective. There are several examples where, although a series of hazard events are documented, but the effects on the populations that inhabited the region are not investigated, as can be observed on volcanism in Central America (Torrence and Grattan 2002) and México (Barrera Rodriguez 1997); floods, plagues, and other events in the European Middle East (Brown 2017); earthquakes, tsunamis, and coastal subsidence in the American Northwest (Losey 2005). In most of all of those cases, a prediction menu was assumed for the situation of the human populations: the destruction of the settlements, the migration, and in the best scenario the adaptation and the environmental resiliencies, with which an image of cultural stability was offered. The prevailing hypothesis was that "simple" societies seemed to be more resilient than complex societies, since the latter relied on a built environment and economies based on labor specialization, redistribution, and extensive trade routes (Torrence and Grattan 2002).

It appears that the researchers concentrated on particular cases of episodic phenomena, which were commonly assigned as "disasters" because their inhabitants could not be facing nature. Therefore, a diversity of variables and situations were omitted, especially with regard to the long-term effects of the event and the possibilities of recovering the environment, human populations, the settlements, and particular habitat that constitutes their environment. It even obscures the discussion about the particularities of the natural event that triggered the disaster, for example, the intensity of the earthquakes, the scope of volcanism, which today anthropology has shown to be key parts to understand as part of the equation that includes vulnerability, risk and disaster itself (Torrence and Grattan 2002; García Acosta 2005; Campos Goenaga 2016).

The methodological aspect is one of the most developed in recent years, where it has been

observed the effectiveness of incorporating various sources to analyze these human-nature interactions, considering that archaeology should have the tools for the study of social decline and collapse, since that long-term chronologies could be achieved, and are a central part of the archaeological record. In most cases, where in the absence of written materials, the material remains of societies and stratigraphic contexts are evidences most important to study these phenomena (Brown 2017).

However, the practice to retrieving environmental and socials information through the revision of historical, ethnohistorical, and even ethnographic evidence is practically the most frequent and allows to establish long chronological sequences, related to changes of local or regional landscapes, sociocultural practices, impact and presence of episodic events or events biological as the presence of pests and epidemics. These aspects provide to archaeology with a series of alternative evidences to construct or discuss the hypotheses that are formulated regarding the study of natural phenomena and disasters (Torrence and Grattan 2002; García Acosta 2005; Campos Goenaga 2016.

In that context, an emerging discipline is archaeo-seismology, which although initiated as a "curiosity" collecting data on sources and contrasted with field data, became a multidisciplinary collective effort to obtain the greatest amount of information from ancient earthquakes records, which can be assessed by the growing number of catalogues and the regional and intensity information contained in each one of them. In some cases, this information is the basis for establishing regional cultures for the prevention of earthquake damage (Sintubin 2011).

International Perspectives: What Is the International View From Where the Author Is?

In the light of above process and discussions, various scholars interested in promoting interdisciplinary research have emerged, promoting collaborations with colleagues from the physical-natural fields and the social sciences, either through periodic academic events or establishing research networks.

One of the first experiences in Latin America was the *Red de Estudios Sociales en Prevención de Desastres en América Latina* (Social Studies Network on Disaster Prevention), which work from 1992 to 2015 (http://www.desenredando.org/). Another one with mainly Ibero-American scope and influence is the *Red Temática de Estudios Interdisciplinarios sobre Vulnerabilidad, Construcción Social del Riesgo y Amenazas Naturales y Biológicas* (Thematic Network of Interdisciplinary Studies on Vulnerability, Social Construction of Risk and Natural and Biological Threats) (http://sociedadyriesgo.redtematica.mx/). Most recently was announced the work of the Global Human Ecodynamics Alliance (http://www.gheahome.org/).

These are some of the collective academic efforts that offer ongoing dialogue between researchers (Symposium, Congress, Seminars, Workshops), outreach actions (courses, brochures, articles, books, social networks, and mass media), as well as Internet portals for free access to written and multimedia files on all aspects related to risk, vulnerability, disasters, and, in general, perspectives on human-environment interactions.

These efforts are supported by international foundations, by public and private organizations, both at national and international levels. One of the most notable organisms is the United Nations Office for Disaster Risk Reduction (https://www.unisdr.org/), where it can be found an up-to-date statistics to measure risk and vulnerability in current societies. However, it is worth highlighting the limited and marginal collaboration of archaeology in this growing field of research.

Future Directions

The apparent dominance of humans over nature is daily tested, as populations are increasingly vulnerable to natural phenomena and disasters, among other causes due to the increased rate of population growth, the loss of habitats, and the

intensive use of natural resources, including the nonrenewable. In this context, it is reiterated that archaeology can make key contributions to the interdisciplinary study of the disaster in various aspects (Torrence and Grattan 2002; Cooper and Sheets 2012), here is commented some emerging and promising issues in the current literature.

One is filling the gap between salvage archaeology after a disaster, and its later contributions both to the recovery of the spaces of daily life prior to the disaster, and in the understanding of the symbols of loss and, in general, to collaborate in creating a collective memory (Bagwell 2009). A close collaboration with anthropologists and in general with civil and governmental organizations involved in the processes can be made.

The combination of geoscientific and archaeology studies could help to reinterpret the episodic natural phenomena of the past allows providing data and time series in the establishment of patterns that are useful for the establishment of public policies and for outreach processes (Riede 2017).

The archaeology could document the circumstances in which humans adapted to the particular environments that are generated by climatic changes. In several regions the data, however, may be scarce, so it is possible to alternately work in the construction of computational models that allow to recreate in a reliable way the environmental scenarios and thus establish more refined hypotheses about the adaptive strategies used by human populations (d'Alpoim Guedes et al. 2016). It should be noted that those models could be adjusted to include the variables referring to natural phenomena, especially in those regions that are susceptible to the presence of episodic phenomena, such as coasts, seismic, hydrographic, volcanic regions, among others.

Recognizing the importance that disasters and natural phenomena have had and have in the daily life of human populations, it cannot be ignored that these can also influence the survival of a series of symbolic elements, either sites or objects, several of them considered as cultural heritage, protected by local, regional or world-wide legislation. Development of methodologies to measure the vulnerability of these elements is important to establish measures of protection or mitigation of risks applied by civil or governmental agencies, responsible for the preservation of those sites (Minos-Minopoulos et al. 2017).

Since the study of disasters is located in the sphere of interactions between humans and the environment, this implies revising the theoretical aspects that allows clarifying its dynamics from other perspectives, especially if the humans were a particular element of the environment, belonging to the past and present biodiversity.

The human is also a species with a sophisticated scientific knowledge, that includes the so-called ethno-knowledge as part of the scientific thinking (Ramos Roca and Corona 2017; Fitzhugh et al. 2018). Then, the research from ethnobiological and biocultural spheres highlights the importance and influence of those local knowledge on the use of humanized landscapes at rural localities and how also that modifies the influence of globalization in the cities of the planet. That understanding of different perspectives may be necessary to address the complex problem of the disaster in a diachronic way, since that affects to all the biodiversity, but also to a particular species, which is human, and whose survival depends on their intuition and ability to dialogue. Our opportunity to continue the hominization process depends, perhaps, on our ability to continue understanding, and of build societies based on collective knowledge with quality of life and sustainable for the planet.

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Eyo, Ekpo Okpo

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Basic Biographical Information

Professor Ekpo Okpo Eyo was an eminent Nigerian scholar of many parts known to people as an Archaeologist, art historian, and museologist. He was regarded as a giant pillar, on which the growth of Nigeria's museums, was establishment in Nigeria.

Ekpo Okpo Eyo was born on 28 July 1931 at Creek Town, Odukpani Local Government Area, of the present-day Cross River State, Nigeria. He began his early education at the Creek Town School and subsequently at the Duke Town

School, Calabar. His secondary education was at the Evening Secondary Continuing School, Calabar between 1937 and 1947. In 1960, he proceeded to the Institute of Archaeology, London, and Pembroke College, Cambridge University, where he spent the next three years (1960–63). It was at the Institute of Archaeology, London, that Eyo began to chart a path for the journey he was to take for life. However, it was in Ibadan that his intellectual maturity blossomed. Having obtained a B.A. (Cantab.) in Social Anthropology in 1963, and an M.A. (Cantab.) in 1967, he earned his Ph. D. in Archaeology in 1974 from the University of Ibadan, the first Nigerian to ever achieve this feat.

As a scholar, he garnered several awards including those received during his early years: School Prize in English and Mathematics at his Duke Town School, Calabar, in 1947; *Silver cup in Broadcasting* at the "All Nigeria Festival of the Arts" in 1956. The following year, he was awarded a Certificate in Conservation and Restoration of Archaeology and Ethnographical Specimens at the University of London in 1957. In 1962, he earned the Gordon Childe Prize for the best student of the year in Archaeology at the University. The same year, Professor Eyo was offered an associateship of the Museum Association of Great Britain and Ireland, and was awarded a Professional Diploma in Museology.

Major Accomplishments

He distinguished himself as the first and only Nigerian Director of the Federal Department of Antiquities (1968–1979), and first Director General (DG) of the National Commission for Museums and Monuments (NCMM) between 1979 and 1986. During his stint as a Director for 18 years, Ekpo Eyo laid the foundation of NCMM and made it a success. In the following years, Professor Eyo became an authority in Archaeological research, particularly African arts. His passions for archaeology and the arts were inseparable. It was once said that it was to the arts that he devoted more love and attention. However, Prof Eyo opined that it was Archaeology that opened his eyes to the arts. Thus, among the several positions he held, between 1963 and 1973, he was the President of the Museum Association of Tropical Africa (1963–73) and Vice President of the Advisory Council of the International Council of Museums (ICOM) (1965–74). Between 1976 and 1980, he became the chairman of the West African Archaeological Association; Vice Chairman of the World Heritage Committee of UNESCO; and Chairman, Organization of Museums, Monuments and Sites in Africa (OMMSA) from 1976 to 1978.

Ekpo Eyo: A Blend of Archaeology and the Arts

His passion for the arts was legendary that, Prof Ben Enwonwu, one of Nigeria's finest Artists, described him as a great man of Antiquities (Adaka 2012). This passion culminated in the exhibition "Treasures of Ancient Nigeria: Legacy of 2000 Years." It successfully put an end to the concept that the African continent lacked any civilization until contacts with Europe. The exhibition was a major instrument that made Nigeria more respected around the world. The exhibition was later to tour Britain, USA, and Canada between 1980 and 1986 (Archibong 2011). The exhibition had been published into a book, with the same title, coauthored by Frank Willet in 1980. Other books written by him included *2000 Years of Nigerian Art* and *From Shrines to Showcases: Masterpieces of Nigerian Art*.

After retirement from the NCMM, Eyo was appointed Professor of African Arts and Archaeology at the Department of Art History and Archaeology, University of Maryland, College Park, USA, in 1986. There he spent the latter part of his life researching and teaching. During this time, Professor Ekpo Eyo often carried out archaeological excavations in Calabar. One of the major results of these excavations was *The Terracottas of Calabar*, published in 2008. Professor Eyo published over 25 scholarly articles in learned journals and delivered about 30 lectures in museums and top universities in America Europe and Nigeria. He was, in 1975, admitted into the *"Ordre des Arts et des Lettres"* by the French

Government. In 1980, he bagged the Officer of the Federal Republic (OFR) award by the Federal Government of Nigeria. In 1989, he was conferred with an Honorary Degree of Doctor of Letters by the University of Calabar, Nigeria. Five years later, he was presented with the Art Council of African Studies Association (ACASA) Leadership Award at the 13th Triennial Symposium on African Art at Harvard University.

†On May 28, 2011, Professor Ekpo Okpo Eyo passed away in Maryland, USA, at the age of 80. A former Secretary General of the Commonwealth, Chief Emeka Anyaoku, said of him: "a true icon of Nigerian Archaeology, Anthropology and Museums, and an outstanding scholar of Nigeria's cultural heritage (Adaka 2012)." However, a succinct description of him was given by a former director of heritage, monuments, and sites in Nigeria that Prof Eyo, even in death, is "a priceless museum piece (Archibong 2011)."

Cross-References

- ▶ West Africa: Museums
- ▶ West and Central Africa: Historical Archaeology

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