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The Archaeological Study of Sacrifice*

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Abstract

Sacrifice is one of the most common manifestations of human religious thought and behavior, yet archaeology has only recently begun to devote significant attention to the practice. This article reviews the diverse ways in which archaeologists have studied sacrifice and how work might proceed in the future. Both animal and human sacrifice are considered, along with the question of whether these two manifestations of ritual killing are significantly distinct. After examining how sacrifice can be identified in the archaeological record, the review outlines important new developments in bioarchaeology and zooarchaeology that facilitate study of the geographical origin of victims, lifestyle, and health prior to sacrifice, preparations for sacrifice, methods of ritual killing, and postmortem treatment. Proceeding beyond the mechanics of the practice, the article discusses how archaeologists can study sacrifice in its social context as well as its spatial and temporal dimensions.

DEFINITIONS

Sacrifice has been, and continues to be, a major component in religious practice and thought throughout the world. As part of the intensified recent archaeological engagement with religion and ritual (Barrowclough & Malone 2007; Fogelin 2007; Insoll 2004, 2011a; Kyriakidis 2007; Raja & Rüpke 2015; Steadman 2009; Swenson 2015; Whitley & Hays-Gilpin 2008), sacrifice has received new attention in recent years, inspiring a number of edited volumes on the subject (Klaus & Toyne 2016, Murray 2016, Porter & Schwartz 2012, Tiesler & Cucina 2007). This article discusses the concept of sacrifice, how it can illuminate the study of human societies, and how it can be approached archaeologically. Through archaeology, we can apprehend the entire temporal scope of the practice and its diverse manifestations, complementing the textual and historical sources when they are available.

As shown below, most archaeological attention has been devoted to functional issues: the role that sacrifice plays in societies and the activities of individual agents in the performance of sacrifice. Although archaeologists acknowledge that the meaning and beliefs associated with sacrifice are important foci of study (Fogelin 2007), these issues are often underplayed owing to the difficulties in accessing them in the material record.

Sacrifice is usually understood to be a religious act. The English term sacrifice, also employed in Romance languages, derives from the Latin *sacer* (“sacred”) and *facere* (“to make”), meaning “to make sacred” or, perhaps, “to perform the sacred rites.” Although attempts to define religion can easily lead to endless circumambulations, the concept certainly involves recognition of, and interaction with, supernatural entities (Renfrew 2007, pp. 112–14). Some scholars have questioned whether it is productive and/or ethnocentric to separate religious aspects of human life from nonreligious aspects, or sacred from profane (Campbell 2012; Masuzawa 2012; Swenson 2015, p. 332). However, the degree to which ideas about the supernatural permeate the different aspects of life varies from society to society, so it can be contended that the category of religion still has utility (Fogelin 2007, p. 60; Schilbrack 2010, 2012).

As with religion, achieving a workable definition of sacrifice is a quixotic enterprise (McClymond 2008, pp. 1–2). Some researchers have proposed that sacrifice involves the killing of a living thing and the offering of its life or life energy to supernatural beings, with resulting benefit to the sacrificer (the person for whom the sacrifice is performed) through consumption of part of the offering (Humphrey & Laidlaw 2007). But consumption may not necessarily be part of the process, so Campbell (2012) identifies sacrifice only as ritualized action entailing destruction and offering to supernatural entities.

If sacrifice must entail an offering to supernatural beings, then some well-known varieties of sacrifice such as retainer, construction, and symbolic/dramatic sacrifice (discussed below) would not qualify. A way to elude this problem is to define sacrifice as “a slaying done with the direct intent of affecting the suprahuman realm of immaterial entities” (Tatlock 2006). An additional question is whether killing must be part of sacrifice. For example, the offering of vegetal and liquid substances to supernatural entities can be considered sacrifice (McClymond 2008). But even in those cases, offerings of stone, clay or metal are often comprehended as “killed” entities whose life force is released as an offering to the divine (Insoll 2011b). Examples might include the bog deposits of northern Europe and the offering caches in Mesoamerican and Andean public buildings.

Distinctions between sacrifice and other forms of ritualized violence are also the subject of debate: Are all examples of ritual animal slaughter or ritual killing of humans “sacrifice,” or is it useful to employ greater selectivity in our application of the concept (Hesse et al. 2012)? Ritual warfare, the execution of criminals, and the ritual slaughter of animals for human consumption as

in Islam or Judaism involve ritualized violence, but they differ from “sacrifice” (Bell 2009, p. 114, n. 75; Purdum & Paredes 1989). If all ritual killing of humans and animals is defined as sacrifice, then the term loses its utility.

Agonizing over definitions will ultimately prove unproductive. As Bell notes with respect to the definition of ritual, “[N]o field ever moves forward because a good number of people agree on the definition of some central concept that then allows them to get down to work” (Bell 2007, p. 283). I argue that considering retainer, symbolic/dramatic, and construction sacrifice together with offerings to supernatural entities will be more useful than excluding them, given their common understanding as sacrificial acts.

Also important is the comparability or distinction between animal and human sacrifice. As Girard (1977) observed, scholars concerned with the general study of sacrifice rarely discuss human sacrifice, and those who focus on human sacrifice isolate it from studies of animal sacrifice. Underlying this distinction between human and animal sacrifice is the presumption that human victims are unsuitable, whereas animals are eminently sacrificeable. The evidence for human sacrifice is often, if not usually, contested, given the discomfort caused to present-day sensibilities (Recht 2014). But the question remains as to whether significant differences exist between human and animal sacrifice apart from the nature of the victims and whether we might understand sacrificial practices in terms of “continuums of killing” (Klaus & Toyne 2016, p. 315). Examples of such continuums include animal and human “retainers” interred in high-status tombs intended to serve the deceased elite persons in the afterlife. The mutability of human or animal sacrificial victims is likewise apparent in Shang China, where sacrificed war captives were interchangeable with sacrificial animals (Campbell 2014a), and among the Classic Maya, where prisoners of war intended for sacrifice were similarly lowered to the status of animals, their bodies cut up like game animals after their deaths (Houston et al. 2006).

In such cases, humans are considered superior to animals, but the assumption that nonhuman animals are always a distinct and subordinate category has been questioned (Argent 2010, Knight 2005, Miller 2005). The “animal turn” in humanistic and social science research necessitates a rethinking of animal–human relations (Ritvo 2007), and recent archaeological work has critiqued anthropocentrism and highlighted the agency of nonhuman animals (Overton & Hamilakis 2013). However, the exploration of animal agency in cases of sacrifice remains to be attempted.

Binary human/animal categories are also questioned in Amerindian perspectivism (Viveiros de Castro 1998), which observes that nonhuman animals can be considered persons in diverse societies, with humans transforming into nonhuman animals and vice versa (see also Willerslev 2007). However, groups considering nonhuman animals to be persons often tend to be hunter-gatherers, whereas sacrifice is typically practiced by sedentary agriculturalists (Russell 2012, p. 125).

Considering sacrifice as a discrete entity carries with it certain dangers. Sacrifice, i.e., the ritual killing itself, is almost always situated in a network of practices and is not an isolated act. In consequence, an examination of sacrifice must include the broader context in which sacrifice occurs and the ritual practices that are enacted prior to, coincident with, and subsequent to the killing.

INTERPRETATIONS AND MOTIVATIONS

Explanations for why people sacrifice constitute an immense subject that can only be briefly cited here. When reviewing the various reasons put forward for sacrifice, one must bear in mind that sacrifice can have multiple functions and meanings simultaneously.

Among the classic theories are those maintaining that sacrifice is intended as a gift to supernatural entities (Tylor 1874, van Baal 1976), with the expectation of a favor to be received from the deities in return (the principle of *do ut des*, “I give, in order that you may give”) (Beattie 1980).

Such a gift typically entails an act of abnegation, in which the sacrificer deprives him- or herself of a valuable possession.

The sacrificial gift is often considered to nourish the gods, who depend on humans for their sustenance. In Mesopotamian mythology, humanity was created to supply food for the deities, who were thus freed from the laborious task of food production. Likewise, the ancient Mesoamericans considered themselves to be in sacred covenant with the gods: To survive, humans consumed gods in the form of maize and rain, and the gods were fed in turn through sacrifice of human individuals and the offering of their blood and hearts (Monaghan 1990, pp. 562–63; 1995, p. 225). As Monaghan (1995, p. 226), explains “‘to eat,’ people must in turn ‘be eaten.’” Moving away from understanding sacrifice as the presentation of gifts, Hubert & Mauss (1964) and W. Robertson Smith (1894) proposed that sacrifice functioned as an avenue of communication and communion with divine entities.

One might ask why the presentation of gifts or efforts to effect communion with the supernatural requires an act of killing. In many cases, killing is believed to release the life force of the victim and thus facilitate its transmission to the deities. But the relationship between sacrifice and divine sustenance is also likely to be significant. Because eating in the human world requires killing, it follows that the nourishment of divine entities requires the death of living organisms.

Another perspective on the violent aspect of sacrifice is offered by Girard (1977), who maintains that sacrifice functions to channel the violent energies of the human community onto an animal or human victim. In this scenario, the victim must resemble other members of the society enough to provide an appropriate target but must be marginal enough to avoid the enactment of revenge. Also focusing on the violent aspect of sacrifice, Burkert (1983) proposed that humans developed the practice as a way to ritualize and thus decriminalize the killing of their fellow creatures in the hunt.

Such global theories are often criticized for failing to account for the historical and social specifics of each case of sacrifice, as well as the great variability in the types and meanings of sacrifice: “[T]he nineteenth and early twentieth-century interest in defining sacrifice in universal terms has given way, in our times, to an awareness that sacrifice becomes meaningful only in the context of the particular religious tradition in which it is performed” (Monaghan 1995, p. 222). Nevertheless, the turn to particularism should not be allowed to obscure important cross-cultural patterns or narrow the range of our interpretive possibilities (Keane 2008, pp. S112–13; Smith 2012).

Some sacrifices are not concerned with the presentation of gifts or communion with the divine. Particularly common is retainer sacrifice, which entails the killing of humans or animals in order for the victims to accompany their social superiors into the afterlife. Perhaps the best-known archaeological example is the Royal Cemetery of Ur in third-millennium BC Mesopotamia, where as many as 73 people were buried in tombs along with high-ranking individuals (Baadsgaard et al. 2012). Other examples of retainer sacrifice derive from such contexts as Shang China (Campbell 2014a), Early Dynastic Egypt (Morris 2014, but see Hikade & Roy 2015), Bronze Age Nubia (Judd & Irish 2009), Classic Maya (Houston et al. 2015), Moche Peru (Alva & Donnan 1993), and Cahokia (Emerson et al. 2016, Koziol 2012). A major study by Testart (2004) proposed that retainer sacrifice is based on bonds of personal loyalty established between leaders and dependents, as opposed to loyalty to an institution.

Construction or foundation sacrifice intends to ensure the safety and prosperity of a structure by the killing and interment of living beings in its foundations (Wessing & Jordaan 1997). Symbolic or dramatic sacrifice might include such practices as the ritual slaughter of animals at the conclusion of political treaties in the ancient Near East, where the violent treatment of the victim was intended to replicate the fate of those who would violate the treaty.

Considering the nature of sacrificial victims, a certain selectivity can generally be observed. It is often understood that the most effective victim will be as similar as possible to the sacrificer, so as to serve as a substitute for that person (Hubert & Mauss 1964). In such cases, a human is the closest substitute one can provide, but a human might not be used owing to moral strictures, expense, or difficulty. Animal victims are usually domesticates, ostensibly because a domesticated animal is closely associated with the human community and can serve as a stand-in for a human, in contrast with animals hunted in the wild (Beattie 1980).

SOCIAL CONTEXTS

Of particular interest and accessibility to archaeologists are the social ramifications and associations of sacrificial behavior. The ways that social hierarchies and group identities can be legitimized and reinforced through sacrifice are well documented (Swenson 2014). Social hierarchy and differentiation are foregrounded and perpetuated through the inclusion of specific persons as officiants and observers in sacrificial rituals and the exclusion of others. Such differentiation may also be evident in the assigned ritual roles, in which higher-ranking people perform the more important tasks. Likewise, hierarchy may be expressed in the distribution of sacrificial products, as in classical Greece, where meat obtained from animal sacrifice was dispersed according to social status (Knust & Várhelyi 2011b, Naiden 2012). Social ranking may also play a role in the selection of victims for human sacrifice, which are often relatively powerless individuals such as women, children, and war captives. Because the gods were understood to participate in sacrificial rituals, the social identities and differences observed in those rituals were legitimized and naturalized by the divine presence (Isaakidou et al. 2002, p. 90).

Sacrificial behavior has been said to “perform” social realities (Inomata & Coben 2006, Swenson 2014). For example, Carrasco (1999) writes that Aztec sacrifice performed the city of Tenochtitlan, and Campbell (2014a) holds that Shang sacrifice performed the Shang world order. However, a tension exists between the different archaeological uses of the term “perform,” which can either mean to present an event theatrically or to embody and effect a social reality. Rather than “performing” social worlds, perhaps it is more apt to say that sacrifice actively constitutes them.

The emergence of early states was often accompanied by an increase in rituals of sacrifice, an association that accords with the intensification of ritual in periods of social change (Swenson 2014). In these polities, the communication with the supernatural facilitated by sacrifice naturalized the new social inequalities (Morris 2007). For example, Donnan (2010) proposes that human sacrifice was an essential component of Moche “state religion” and helped to legitimize the status quo, and Bourget (2016, p. 414) maintains that sacrifice was specifically associated with Moche rulers and emphasized their associations with the divine. Among the Classic Maya, the king was thought to have a particularly strong communicative conduit to the gods, and the king’s provision of human sacrificial blood for divine sustenance demonstrated his capabilities and legitimacy as ruler (Schele & Miller 1986). In Aztec society, human sacrifice legitimized not only the ruler but the entire state and its expansionistic character because state-conducted warfare acquired captives whose sacrifice ensured the successful functioning of the universe (Demarest 1984, Graulich 2005, Ingham 1984).

Some scholars posit that human sacrifice was employed to intimidate newly hierarchical societies into accepting authority by demonstrating rulers’ power over the “bare lives” of their subjects (Dickson 2006, Watts et al. 2016). In accordance with this sentiment is the reported statement from a nineteenth-century CE king of Asante: “[I]f I were to abolish human sacrifices, I should deprive myself of one of the most effectual means of keeping the people in subjection” (Wilks 1975, p. 594). But pure coercion is an expensive and unpredictable means of perpetuating elite control;

legitimation of authority through divine associations or other well-accepted cultural norms is likely to be far more effective (Yoffee 2005, p. 40). Therefore, the employment of human sacrifice for purposes of intimidation may have been typical of insecure political elites, as Carrasco (1999) has posited for the Aztecs (but see Trigger 2003, p. 485).

We also note that human sacrifice, especially retainer sacrifice, often has a relatively limited chronological extent. Frequently associated with newly formed authoritarian states, these practices are discontinued once the point is made that the ruler has unprecedented and unlimited power because the enterprise is expensive, engenders resentments, and may lead to challenges and contested interpretations (Morris 2014).

Sacrifice can serve to illustrate and intensify membership in ethnic and kin groups, in addition to reinforcing social hierarchy. In classical Greece, sacrifice was integral to political life, and political events were accompanied by sacrifices in which citizens were expected to participate, strengthening their identities as members of the polis (Knust & Várhelyi 2011b, p. 9). In a decree mandating that all Roman subjects sacrifice to their local gods in a fashion sanctioned by the state, the emperor Decius weakened the role of provincial cults in reinforcing indigenous group identities (Townsend 2011).

The relationship between gender and sacrifice is examined in detail by Jay (1985, 1992). Noting the common exclusion of females from sacrificial rituals, except as victims, Jay argues that sacrifice creates bonds of intergenerational continuity between males in a way that circumvents women and their monopoly on childbearing. Sacrifice therefore provides a “remedy” to men for having been born of women, furnishing an alternative mode of male-to-male succession. Such a perspective is thought to be typical of societies where intergenerational continuity and inheritance are based on property such as farmland and herd animals. Although Jay’s consideration of gender and sacrifice is significant, one may doubt that sacrifice functioned primarily as a metaphor for male-to-male descent: Most participants in sacrifice were males not because intergenerational male continuity was the main focus, but because public actors tended to be male.

IDENTIFYING SACRIFICE ARCHAEOLOGICALLY

A varied arsenal of methods is available to study sacrifice in the archaeological record, including analysis of architectural and stratigraphic contexts, zooarchaeology, bioarchaeology, and iconography. Recent efforts to move zooarchaeology beyond a focus on “protein and calories” and toward aspects of animal–human relationships such as ritual and symbol constitute an important trend (Russell 2012). Likewise, the growth of biocultural approaches in bioarchaeology allows for exploration beyond identifying age, sex, and life histories to a focus on historical and social contexts (Zuckerman & Armelagos 2011).

Of the questions that archaeology may address with respect to sacrifice, most elementary is its identification in the archaeological record (Schwartz 2012, pp. 9–14). Because ritual tends to be repetitive, we may seek to identify recurrent patterns of behavior that stand out from the norm and that can be hypothesized as sacrificial. Such hypotheses are especially warranted if human or animal remains bear signs of violent death and are found in contexts that differ from those typical of deposited bodies in the society in question.

Among contexts likely to involve sacrifice, most conspicuous are those understood as religious, which are recognizable archaeologically through diagnostics suggested by Renfrew (1985, 2007). However, the recent focus on ritualized behavior, places, and objects has highlighted the fact that such entities can be used for ritual purposes in one instance and quotidian purposes in another, requiring more nuance in the evaluation of putatively religious contexts (Bell 1992, Bradley 2005, Murphy 2008). Sometimes specific architectural types are repeatedly associated with likely

sacrificial remains, providing an architectural diagnostic like the D-shaped features at Wari sites in Peru (Cook 2001). Sacrificial locales may also be identified through seriological analyses of blood residues on archaeological features (Verano 2001).

In addition to spatial contexts, paraphernalia associated with sacrifice may also be recognized. These would comprise distinctive objects repeatedly associated with sacrificial deposits, such as tripods and altars used for animal sacrifice in classical Greece or the regalia worn in Moche human sacrifice (Donnan 2010, Neer 2012). To verify such identifications, residue analysis may be a useful tool. When Moche goblets that resemble vessels depicted in painted sacrifice scenes were analyzed, they yielded traces of human blood, thus corresponding to the artistic depictions showing the vessels being used to drink the blood of sacrificial victims (Bourget 2016, p. 369).

Whether or not the context is “cultic,” sacrifice may be hypothesized if a body subjected to violence was not placed in a conventional locus for disposed humans or animals or if the body received treatment distinct from that usually accorded deceased individuals. Given the prevalence of sacrifice in classic Maya society, human remains found in problematic contexts lacking conventional mortuary treatment are typically viewed as sacrificial, with examples including caches of bones, bone scatters, and disrespectfully handled primary interments (Cucina & Tiesler 2007b, Tiesler 2007). But if violently dispatched humans are found in religious or other unconventional contexts, it will be necessary to confirm that their deaths were not caused for such reasons as execution, murder, or warfare.

In some cases, sacrificial practices allocate specific parts of a sacrificed animal to the divinities, retaining other parts for human consumption (Leviticus, chapters 1–7; Ekroth 2008). Therefore, one would expect certain segments of the skeleton to recur in archaeological contexts suspected of ritual use. In classical Greece, the tail and thigh of sacrificed animals were reserved for the gods and burned, whereas the meaty parts were consumed by humans (Chenal-Velarde & Studer 2003, Detienne 1989, Ekroth 2014, Jameson 1988). The remains of both types of animal elements were identified in the sanctuary of Poseidon in Isthmia, where burned bones were found near an altar and unburned or partially burned bones were found in a separate location (Forstenpointner 2003, Gebhard & Reese 2005; see also Hamilakis & Konsolaki 2004). Selected species and body parts (bovid crania and autopodial elements) interpreted as sacrificial remains were also discerned in Iron Age sites in the Central Alps (von den Driesch 1994). If particular body parts recur in the archaeological record, their presence should not be a product of the differential survival rates of specific bones or of the procedures used to process bodies (Isaakidou et al. 2002).

Also indicative of sacrifice is the presence of skeletal material from violently dispatched individuals of specific ages or sexes. In the cultic installation at Iron Age II Tel Dan in the southern Levant, faunal remains originated from animals of younger age than those found elsewhere in the site, implying the selection of specific-aged individuals for ritual purposes (Hesse et al. 2012). Human sacrifice of children and adolescents in the Inca *capacocha* interments found high in the Andes likewise supplies evidence of persons of specific ages being chosen for sacrifice. Particularly notorious is the attribution of child sacrifice to the ancient Carthaginians. A recent study using biometry, light microscopy, a scanning electron microscope, and serial microCT sections of teeth concluded that infants in urn inhumations at Carthage died at an age of 1–1.5 months and had been sacrificed, given the divergence of the age profile from that suggested by contemporaneous mortality rates (Smith et al. 2011). Yet Schwartz (2016) argues that many of the human remains were prenatal and thus not subjected to sacrifice.

Identification of the retainer sacrifice of humans can be accomplished if persons accompanied by prestige objects were deposited concurrently with others having few such objects and/or unconventional or disrespectful modes of disposition. If the nonelite individuals also show signs of violence or binding, the evidence for retainer sacrifice is more robust, as it would be if the mortuary

structure is of impressive scale or sophistication. Simultaneous interment can be inferred when remains from several individuals are found in similar states of preservation in a discrete stratigraphic context (Bentley & Klaus 2016, Tomasto-Cagigao et al. 2016). But as Cucina & Tiesler (2007a) point out, multiple persons interred contemporaneously need not be retainers, as in the case of the funerary chamber of King Pakal at Palenque, who may have been buried with other members of his “house.”

Animal retainer sacrifice is indicated if animal skeletons without signs of butchery are found together with human skeletons and, perhaps, the remains of draft vehicles, as found at the Royal Cemetery of Ur or in elite graves in Shang China. At Umm el-Marra in third millennium BC Syria, groups of equids were buried in discrete installations near elite human tombs. Although some of these were originally interpreted as specimens of retainer sacrifice, faunal analysis has revealed that many of the interred equids were of an advanced age and may not have been sacrificed at all (Weber 2012), demonstrating the hazards of drawing premature conclusions.

Identifying construction sacrifice should involve a complete or near-complete human or animal skeleton with evidence of violence interred in architectural foundations. Such practices are attested in societies as diverse as Moche (Bourget 2016, pp. 312, 326), Chimú (Verano 1995), Maya (Welsh 1988), and the ancient Near East (Tatlock 2006). Particularly impressive is the evidence from Teotihuacan, where human and animal victims (e.g., eagles, jaguars, pumas, wolves, snakes) and rich artifactual deposits were embedded within the Moon Pyramid (Sugiyama 2005, 2011).

Interpretive problems and ambiguities will not be infrequent when it comes to identifying instances of sacrifice. For example, in societies such as pre-Columbian Mesoamerica where ritual killing of humans was ubiquitous, it can be tempting to identify any evidence of violent death as sacrifice. Sugiyama (2005, p. 201) reports that excavation in San Francisco Mazapa interpreted eight burials to be victims of sacrifice “because some apparently were decapitated.” Other explanations for violent death might be explored in such cases. At Punta Lobos, Peru, 200 blindfolded and bound individuals had been killed by throat slitting (Verano & Phillips 2016). Given the frequency of captive warrior sacrifice in Peru, one might quickly conclude that these persons were victims of the practice. However, the people involved included children and old men and showed little sign of battle-related injuries. As a result, nonsacrificial explanations such as mass execution or reprisal killing have been advanced.

An example of the multiple readings possible, as well as the interplay between human and animal ritual killing, is attested at Umm el-Marra, Syria, ca. 1600 BC. In a deep shaft in the center of a round monumental platform, 13 humans killed by a blow to the head were deposited under 11 strata of carefully lain animal skeletons, including a pair of vultures deprived of their wing bones. Given the unusual context, violent death, and lack of grave goods, one could interpret the humans as sacrificial victims, but they might also have been community leaders executed by foreign conquerors. It is probable that the animals were sacrificed, but they could be interpreted as either retainers or offerings to deities or, in the case of the vultures, corpse abusers in the afterlife (Schwartz 2013).

As the above discussion indicates, the strongest cases for sacrifice in the archaeological record will benefit from a large data sample and a repeating pattern of several diagnostic traits. The Inca *capacocha* interments provide a good illustration: repeated attestations of individuals of a specific age (children/young adolescents) and sex (adolescents are usually female) are buried far from the usual mortuary loci and show signs of a violent death (Besom 2013, Reinhard & Ceruti 2010). Given the age of the interred persons, it is unlikely that their demise can be attributed to execution or other nonsacrificial causes. For animals, sacrifice is best attested by remains of specific age, sex, species, and body element in a special context, as opposed to generalized animal refuse.

Not interpretable as sacrificial victims will be animal remains found in domestic or midden contexts encompassing a wide range of represented ages, species, and body elements. Also to be excluded are individuals who perished in natural disasters, fires, or enemy attacks, in which case the skeletons should display demographic patterns of a living herd rather than ages and sexes of animals chosen for food or other purposes. Nonfood animals such as dogs or equids found in middens or streets are likewise inappropriate candidates for sacrificial victims.

Among humans, individuals least likely to be sacrificial victims are those who are found in conventional mortuary contexts and accorded normal mortuary treatment. It is possible that non-sacrificial remains will occur outside of conventional mortuary loci as the result of death by fire, war, or natural catastrophe, in which case the bodies would be distributed haphazardly without evidence of age differentiation.

RECENT BIOARCHAEOLOGICAL AND ZOOARCHAEOLOGICAL APPROACHES

Proceeding beyond the identification of sacrifice, recent advances in bioarchaeology and zooarchaeology have allowed for new sophistication in the archaeological investigation of sacrificial behaviors. Such pioneering work is especially common in Andean and Mesoamerican archaeology, owing to the ubiquity of human sacrifice in the ancient societies of those regions. Issues being addressed include the following.

Lifestyle of Victims

Technical analyses and “osteobiographies” (Chávez Balderas 2014) can help determine what kinds of victims were chosen and what kinds of preparatory activities preceded their ritual killing. At the Teotihuacan Moon Pyramid, for example, analysis has shown that animals used for construction sacrifice had been captured and kept in captivity for some time in preparation for the interment (Sugiyama et al. 2014). Stable isotope analysis can reveal whether animals or humans destined for sacrifice were fed special diets (Klaus et al. 2016, p. 208; Szpak et al. 2016), as in the case of an Inca *capacocha* victim who evinced signs of a shift to an elite diet a year before death as well as an increasing intake of coca and alcohol (Wilson et al. 2007, 2013). Among human victims, paleopathological analyses (e.g., evidence of enamel hypoplasias, dental caries, childhood anemia) can be used to determine social status, proceeding on the assumption that relative health and leisure imply elite status while physical ailments, malnutrition, and stress indicate lower rank (Buzon & Judd 2008, Toyne 2016). Nonelite victims are typical among the Maya (Cucina & Tiesler 2007b), as is the case in the Andes (Klaus et al. 2016, Klaus & Shimada 2016, Shimada et al. 2004). However, DNA analysis by Verdugo et al. (2016) revealed that sacrificed individuals from the Maya site of Midnight Terror Cave, Belize, were not physically handicapped and were probably not social outcasts, contrary to previous arguments.

Lifestyle analysis may also indicate the work lives of sacrificial victims. Musculoskeletal studies of bodies from the Ur Royal Cemetery have revealed that the victims probably conducted tasks in life that matched their presentation in death, such as porters, wagon drivers, and warriors (Molleson & Hodgson 2003). However, analysis of sacrificed women found with textile implements at the Chimú site of Tucumé, interpreted as elite female weavers, indicated poor health and musculoskeletal patterns inconsistent with elite status and weaving (Bentley & Klaus 2016).

Important in Mesoamerican, Andean, and Shang Chinese sacrificial data is the identification of captive warriors, a category of victim much desired in those locales. Captive warriors can be recognized if the sacrificed persons are young adult or adolescent males with healed injuries suggestive of combat (Donnan 2010, Verano 2014).

Geographical Origin of Victims

Stable isotope analysis, dental morphology, and mtDNA analysis can be employed to determine the victims' place of origin (Verano 2014). Sometimes these techniques contradict each other. At the Moche site of Huaca de la Luna, mtDNA analysis indicated that victims derived from the local population (Bourget 2016), but dental morphological analyses of nonmetric traits suggested otherwise (Verano & Phillips 2016).

Kin Relations of Victims

Biological distance analysis (especially with dental data) and mtDNA analysis allow for consideration of the genetic relations between sacrificial victims (Bentley & Klaus 2016, Duncan 2012).

Mode of Death

In Mesoamerica and the Andes, human victims were subjected to a variety of fatal treatments now verifiable through osteological analysis, including heart extraction, throat slitting, and decapitation (Chávez Balderas 2014, Kron 2006, Tiesler 2007, Verano 1995). Although Sir Leonard Woolley, excavator of the Ur Royal Cemetery, opined that the human victims voluntarily drank poison, computed tomography (CT) scans have shown that at least some had been bludgeoned to death (Baadsgaard et al. 2011, 2012), calling into question the concept of the "willing victim" (Hansen 2016). The physical actions used to dispatch the sacrificial victims may also be inferred from osteological evidence, including the hand that was used (right or left) and the position of the officiant (in front or in back of the victim) (Hamilton 2016).

Treatment after Death

At Huaca de la Luna plaza 3A, surface cracking and bleaching of bones as well as fly puparia demonstrate that the bodies of sacrificed young men had been exposed for some time after their deaths (Bourget 2016). In the Near East, new research has revealed that the bodies of the sacrificial victims at the Ur Royal Cemetery were subjected to a postmortem sequence of treatments, including heating, dressing in elaborate costumes, display, and arrangement as participants in a feast (Baadsgaard et al. 2012).

After sacrifice, animals are often employed as a source of meat, both for the gods and for people. In Classical Greece, much of the meat consumed by humans derived from sacrifice (Detienne 1977). The study of butchered remains is therefore the purview of zooarchaeology, which can identify species, sex, age at death, body part, and butchering practices (Magnell 2011, Méniel 2015, Russell 2012). When finding butchered animal remains in a religious locale, the archaeologist must exclude the possibility that these were the residue of a nonsacrificial meal consumed by humans or the remains of discarded (or sacred) nonsacrificial animals. Consumption of sacrificed humans may also be part of sacrificial ritual (Carter 2012, Pijoan & Mansilla Lory 1997). To confirm that human remains with evidence of cannibalism had been sacrificed, causes of violent death distinct from sacrifice must be ruled out.

ADDITIONAL METHODOLOGIES

Employing what Bourget (2016, p. 313) terms a discursive approach, iconography can be used to study sacrifice in combination with material culture remains. When utilizing iconography to

study sacrifice, one must remember that images are ideological data, not literal representations of facts (Elsner 2012, p. 157; Verano 2014, pp. 288–89).

A particularly rich data set of iconographic and material culture data is available for the Moche in the first millennium CE Andes. Here, artistic representations of the “Sacrifice Ceremony” with elaborately costumed participants and nude victims are matched with remains from excavations at such sites as Sipán, San José de Moro, and Huaca de la Luna (Castillo 2001, Donnan 2010, Verano 2014). Also matching Moche iconography is the discovery of 75 young male captive warrior victims from Plaza 3A at Huaca de la Luna who had been dismembered, an activity performed subsequent to the Sacrifice Ceremony in Moche art (Donnan 2010).

Although less comprehensive than the Moche evidence, Maya artistic representations include scenes of human sacrifice and the rituals conducted before and after killing (Schele & Miller 1986). In classical Greek and Roman art, representations of animal sacrifice as well as the activities that preceded and followed the killing itself are frequent (Ekroth 2005, Gebauer 2002, van Straten 1995). When examining representations of sacrifice on painted vases, Smith (2016) suggests that consideration of the “gaze,” i.e., which figures are depicted as looking at which, can be useful for understanding the conduct of the ritual. Mesopotamian imagery depicting sacrifice is discussed by Recht (2015).

Although not utilized frequently—for obvious reasons—experimental archaeology can also assist in the study of sacrifice. To better understand classical Greek sacrificial methodology, Jameson (1966) set fire to an ox tail, and Morton (2015) burned thigh bones on a pyre resembling those represented in Greek iconography. If ethnohistoric data are available on sacrificial practices, as with Inca and Aztec societies, these will also complement the archaeological record (Insoll 2004), as will ancient textual sources (Forstenpointner 2003).

BEYOND THE BODY

In addition to studies focused on the body of the sacrificial victim, archaeology can engage with the spatial, temporal, and social contexts of sacrifice. Did the activities occur within a settlement or outside it, in public or private, indoor or outdoor, or monumental or nonmonumental contexts? Issues of access are also significant: Could a large audience witness the events, or was space available only for a small number of people? It will be important to avoid conceptualizing sacrificial ritual as spatially static and instead consider the movement of human and animal bodies through space (Insoll 2009).

For the temporal context, one may investigate when sacrifice occurred with respect to the history of the society in question, the history of the individual community, and, if possible, the time of year. Citing evidence of torrential rains in the sacrificial deposits from Huaca de la Luna, Bourget (2016) posited that human sacrifices there were associated with El Niño climatic events (see Verano & Phillips 2016, p. 254, for a contrary view). In addition to historical or environmental concurrences, it will be useful to determine whether sacrifice was performed together with ceremonies commemorating life passages or other communal rituals such as those associated with war or the agricultural cycle. When considering the temporal aspect of sacrifice, one must recall that ritual and ideology are not static: There is no single, unaltered “Moche sacrifice” or “Moche ideology,” and accordingly Bourget (2016) proposes a history of changing Moche ideologies and sacrificial rituals.

Archaeology is particularly well suited to examine the sociopolitical context of sacrifice. Through study of the species, gender, sex, age, and social status of the victims, and the spatial and historical context of the sacrifice, one can illuminate if sacrifice was used to legitimize hierarchy or reinforce group identities or had other social implications.

SUGGESTIONS FOR THE FUTURE

Thus far, archaeological research has delineated the temporal and geographical extent of sacrificial practices and has supplied details and extraordinary examples that are unavailable from textual sources. Furthermore, new techniques have facilitated more sophisticated studies of actions preceding and following sacrifice and provided additional insights on the nature and history of the victims.

Still, relatively unexplored areas in archaeological sacrifice studies call for further investigation. One surprising example is gender, with exceptions provided by such studies as Blok's (2009) iconographic investigation of the distinction between Greek male animal sacrificers and female libation pourers or Tung's (2012) exploration of differential treatments accorded sacrificed women and men in Wari society. Discarding preconceptions about gender roles in past societies will enable us to entertain such possibilities as female as well as male sacrificed captive warriors or the participation of third (and fourth, etc.) gender persons in sacrificial ritual (Hollimon 2011). Scientific analyses such as nuclear DNA studies might identify individuals who are chromosomally male or female but are marked materially as belonging to a different gender.

Given the relationship between sacrifice and the production and consumption of animal products, the economic aspects of sacrifice deserve greater archaeological attention than they have received. Sacrifice played a major role in the animal economy of many societies, such as classical Greece and Mesopotamia (Kozuh 2014), and archaeology may be able to address how animals were raised, distributed, stored, and consumed in the sacrificial pipeline.

Also underdeveloped is the study of sensory aspects of sacrificial ritual. Dance, music, the screams of the victims, and the stench of corpses must have had a potent effect on the participants in sacrifice (Hamilakis 2013). How to study these variables archaeologically in a way that proceeds beyond the speculative is currently under discussion (Laneri 2010).

As noted above, the meaning and beliefs associated with sacrifice can be difficult to determine archaeologically but are important to pursue (see, e.g., Porter 2012). If available, iconographic, ethnohistoric, or ancient textual evidence will be of assistance, but even in their absence, progress may be achieved through careful consideration of patterns in the material record. For instance, the practice of retainer sacrifice signals belief in an afterlife, the importance of social rank in the afterlife, and the belief that the killing of social inferiors furnished servants after death. In this and other arenas, archaeologists should continue to investigate sacrifice in its historical contexts while also taking note of cross-cultural patterns.

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Contents

Perspectives

- Recovering the Body
Margaret Lock 1

Archaeology

- Rock Art and Ontology
Andrew Meirion Jones 167

- Collective Action Theory and the Dynamics of Complex Societies
Elizabeth DeMarrais and Timothy Earle 183

- Archaeologies of the Contemporary World
Rodney Harrison and Esther Breithoff 203

- The Archaeological Study of Sacrifice
Glenn M. Schwartz 223

- Archaeology and Human–Animal Relations: Thinking Through
Anthropocentrism
Brian Boyd 299

- Social Network Analysis in Archaeology
Barbara J. Mills 379

Biological Anthropology

- Late Australopiths and the Emergence of *Homo*
Darryl J. de Ruiter, S.E. Churchill, J. Hawks, and L.R. Berger 99

- Primate Positional Behavior Development and Evolution
Michelle Bezanson 279

- The Monkeying of the Americas: Primate Biogeography in the
Neotropics
Jessica Lynch Alfaro 317

- Brain Plasticity and Human Evolution
Chet C. Sherwood and Aida Gómez-Robles 399

Anthropology of Language and Communicative Practices

Language and the Newness of Media <i>Ilana Gershon</i>	15
Personal Narratives and Self-Transformation in Postindustrial Societies <i>Cynthia Dickel Dunn</i>	65
Human–Animal Communication <i>Don Kulick</i>	357

Sociocultural Anthropology

Consuming DNA: The Good Citizen in the Age of Precision Medicine <i>Sandra Soo-ŷin Lee</i>	33
Precarious Placemaking <i>Melinda Hinkson</i>	49
Marriage and Migration <i>Caroline B. Brettell</i>	81
Fluid Drugs: Revisiting the Anthropology of Pharmaceuticals <i>Anita Hardon and Emilia Sanabria</i>	117
Humans and Animals in Northern Regions <i>David G. Anderson</i>	133
What Does Catastrophe Reveal for Whom? The Anthropology of Crises and Disasters at the Onset of the Anthropocene <i>Roberto E. Barrios</i>	151
A Bundle of Relations: Collections, Collecting, and Communities <i>Joshua A. Bell</i>	241
The Datafication of Health <i>Minna Ruckenstein and Natasha Dow Schüll</i>	261
China–Africa Encounters: Historical Legacies and Contemporary Realities <i>Helen F. Siu and Mike McGovern</i>	337
Epidemics (Especially Ebola) <i>Sharon Abramowitz</i>	421

Theme: Human–Animal Interaction

Humans and Animals in Northern Regions <i>David G. Anderson</i>	133
--	-----

The Archaeological Study of Sacrifice	
<i>Glenn M. Schwartz</i>	223
Primate Positional Behavior Development and Evolution	
<i>Michelle Bezanson</i>	279
Archaeology and Human–Animal Relations: Thinking Through	
Anthropocentrism	
<i>Brian Boyd</i>	299
The Monkeying of the Americas: Primate Biogeography in the	
Neotropics	
<i>Jessica Lynch Alfaro</i>	317
Human–Animal Communication	
<i>Don Kulick</i>	357

Indexes

Cumulative Index of Contributing Authors, Volumes 37–46	447
Cumulative Index of Article Titles, Volumes 37–46	451

Errata

An online log of corrections to *Annual Review of Anthropology* articles may be found at
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