

## Article

# Inverted Worlds, Nocturnal States and Flying Mammals: Bats and Their Symbolic Meaning in Moche Iconography

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**Abstract:** Bats are depicted in various types of media in Central and South America. The Moche of northern Peru portrayed bats in many figurative ceramic vessels in association with themes of sacrifice, elite status and agricultural fertility. Osseous remains of bats in Moche ceremonial and domestic contexts are rare yet their various representations in visual media highlight Moche fascination with their corporeal form, behaviour and symbolic meaning. By exploring bat imagery in Moche iconography, I argue that the bat formed an important part of Moche categorical schemes of the non-human world. The bat symbolized death and renewal not only for the human body but also for agriculture, society and the cosmos. I contrast folk taxonomies and symbolic classification to interpret the relational role of various species of chiropterans to argue that the nocturnal behaviour of the bat and its symbolic association with the moon and the darkness of the underworld was not a negative sphere to be feared or rejected. Instead, like the representative priestesses of the Late Moche period, bats formed part of a visual repertoire to depict the cycles of destruction and renewal that permitted the cosmological continuation of life within North Coast Moche society.

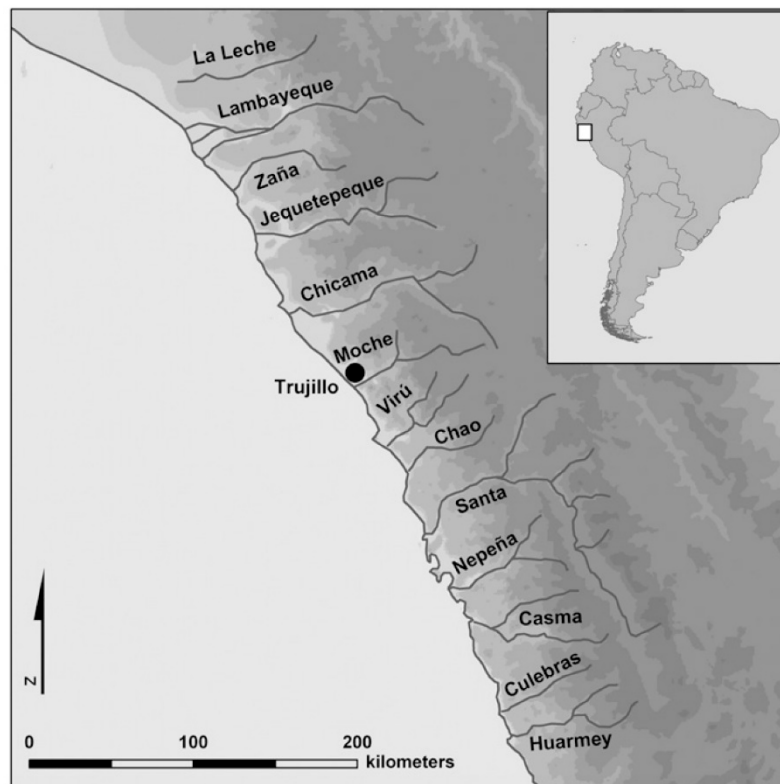
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## 1. The Flying Mammal

Bats are fascinating animals that have conjured strong reactions among many communities and cultures globally. The depiction of bats in different artistic media attests to their importance as symbols, totems and supernatural agents. From Dracula to Batman and zoonotic diseases to sacrifice, bats are evocative of nocturnal states and inverted worlds, yet they form integral roles in the health of ecosystems, the success of agricultural practices and as symbols of fertility and renewal.

Bats are found in the material record of various cultures of the Andes, with the Moche ceramic and metallurgical record providing some of the most well-known examples. The Moche designate a religious and political identity defined by their well-crafted material culture of bichrome pottery, metallurgic objects and large-scale temple sites [Bawden \(1996\)](#); [Bourget \(1994, 2001a\)](#); [Donnan \(1978\)](#); [Donnan and McClelland \(1979\)](#); [Swenson \(2007, 2008\)](#). The Moche sphere of influence (CE 100–850) extended from the Nepeña Valley in the south to the Piura Valley in the north along the north-western coast of modern-day Peru, [Castillo \(2001, 2010\)](#); [Castillo and Quilter \(2010\)](#); [Uceda \(2010\)](#); [Uceda et al. \(2016\)](#) (Figure 1). There were two principal areas of Moche influence in the northern region from the Jequetepeque to the La Leche Valleys, and in the southern region among the Nepeña to the Chicama Valleys. Instead of a unified state in these northern and southern regions, some scholars argue that each river valley consisted of a series of independent polities that engaged with Moche political and social activities and utilized Moche style material culture, [Castillo and Donnan \(1994\)](#); [Quilter and Koons \(2012\)](#); [Koons \(2015\)](#); [Koons and Alex \(2014\)](#). However, others argue for the existence of a

centralized southern state with its capital at the site of Moche (in the Moche Valley) that controlled the river valleys from Chicama in the north to Huarney in the south, [Chapdelaine \(2001, 2011\)](#); [Shimada \(1994\)](#); [Uceda \(2010\)](#).



**Figure 1.** Map of the north coast of Peru (Adapted from [Millaire 2010](#)).

Animals are prominent in the Moche iconographic record. Most research has focused on images and scenes of human sacrifice and anthropomorphic figures, such as fanged deities, even though most animal representations lack human actors, [Alaica \(2018\)](#); [Weismantel \(2018\)](#). Bat depictions are part of the diverse array of animal taxa in Moche iconography. The behaviour of bats could have held significance for Moche communities observing these animals in their daily activities and potentially for their ritual meaning. The bat is found on hundreds of Moche figurative ceramic vessels and in fineline artwork. Furthermore, unlike species such as the jaguar, deer, sea lion, owl and stingray, bats do not usually take part in important hunting, ceremonial and sacrificial scenes. Nevertheless, bats are vital liminal mediators between cosmic realms but also a key species to understand past worldviews: bats are a taxonomic order that is part of the mammalian world but they fly, subsist in nocturnal states and roost with their offspring in an inverted orientation. Past interpretations of bats have insisted on their sinister and chthonic meaning, [Benson \(1987\)](#); [Bourget \(2006\)](#), however, bat behaviour attests to their vital role in cycles of renewal and fertility. The connection of these animals to the different aspects of Moche tripartite cosmology, their role in pollinating plants and their guano as a potential source of fertilizer for agricultural fields highlight their significance in these cycles of creation. The biological tendencies of bats clearly fascinated the Moche and by addressing how bats are represented in their artwork, it is possible to shed light on the symbolic meaning of bats, their association with daily activities related to agriculture and other subsistence practices.

In this paper, I posit that the bat is an essential part of Moche cosmological cycles of renewal. Bats were integral participants in sacrificial activities as well as in daily practices of pollination, crop cultivation and environmental sustainability. This argument is based on two main aspects: (1) the biological characteristics of various species of bats were encountered and observed by the Moche;

and (2) the materiality of bat portrayals in Moche ceramic vessels and fineline artwork represented elite ideology and ceremonial practice. My argument is grounded in the framework of a relational taxonomy, which recognizes that the meaning of material objects is framed by the context of practice [Zedeño \(2009\)](#). By examining the biological realities of bat behaviour in conjunction with concepts of materiality in the investigation of Moche material culture, we can better realize the role of animals in past practices in the Andes and elsewhere.

## 2. Moche Cosmology

An examination of Moche cosmology is difficult as these communities did not record their beliefs and ideas in writing. The iconographic record provides an important source of information about their perspective on the world through naturalistic artwork transcribed in sculpted and fineline representations. Elites controlled the manufacturing of ceramic artwork and therefore our possible interpretation of Moche cosmology from this visual record is biased towards a specific perspective within the upper echelons of Moche social hierarchy. Nevertheless, Moche iconography indicates that this society was keenly aware of their natural environment, appreciating the unique aspects of different animal and plant species as well as distinct ecologies. The detail that is preserved in these representations can provide integral information about the ways that the behaviours of animals were impacting and structuring the perception of the Moche towards the natural world.

The basis of the Moche worldview and cosmology can be approximated by the iconographic record through repeated scenes, themes and characters. An important aspect that underlies diverse interpretations of Moche cosmology from the iconographic record is the lacking classification of supernatural actors, ancestors and many animal assistants. [Berezkin \(1980\)](#) identified two principal groups of figures: shamans and warriors. This dual categorization is argued to reflect the “moiety” structure in Moche society, an asymmetrical social division of individuals in “upper” and “lower” echelons of society. The central role of Deity A (a diurnal figure) and Deity B (a nocturnal figure) in Moche iconographic scenes reinforces this dual division of moieties and the cosmos, [Gölte \(2009\)](#). [Hocquenghem \(1987\)](#) suggests that the themes depicted in visual media represent a ceremonial calendar that define astronomical, agricultural and human life cycles. The rituals that were performed during different phases in this calendar were part of maintaining the cosmological order of the Moche world. The repeated cycles in this Moche calendar aligned with changing seasons and climatic variability that depended on different non-human beings from distinct ecologies. However, [Berezkin \(1980\)](#) highlights the differences between the northern and southern Moche regions. In the north, the cultivation of plants is related to a hero figure that transforms into valued plants from the form of a toad, while in the south, this is related to a fox, [Berezkin \(1980\)](#). This interregional variability underscores that a universal Moche cosmology may not have existed, instead, intra-valley traditions may have underwritten the representation of known Moche scenes.

Moche society was impacted by the shifting social and environmental conditions of the North Coast. In particular, cyclical El Niño events brought about flooding, ecological instability and political strife, [Dillehay and Kolata \(2004\)](#). The response of Moche society can be seen in the daily and ritual activities of the communities, from the scale of agricultural practice to the types of offerings made to sacred spaces<sup>1</sup>. The later phase of Moche ceramic production (Moche V) is the final stylistic shift in the sequence of Moche material culture, coinciding with the construction of Complex Theme murals at Huaca de la Luna and Huaca Cao Viejo, two principal Moche ceremonial centres in the Moche Valley

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<sup>1</sup> There is debate about the nature of the human sacrifice in Moche cosmology. [Bourget \(2001a\)](#) considers the ritual sacrifices of humans during El Niño cycles as important offerings for ceremonially mitigating climatic disasters. However, recently, [Caramanica et al. \(2020\)](#) demonstrate how ancient farmers on the North Coast treated the El Niño phenomenon as part of the norm. This demands a shift in perspective away from the disaster narrative that pervades the interpretation of pre-industrial ceremonial activities. Differently, [Sutter and Cortez \(2005\)](#) highlight that Moche human sacrifice was part of sociopolitical practices in which victims were drawn from a number of competing Moche polities.

and Chicama Valley, respectively (Figure 2). Franco Jordán (2016) posits that these murals, depicting humans, animals, plants and other aspects of the natural world, as the visual representation of a new world order following environmental and sociopolitical changes. These transformations form the basis of Moche cosmology.



**Figure 2.** Mural of Complex Theme 1 at Huaca de la Luna (Courtesy of Luis Manuel González La Rosa).

The Complex Theme mural from Huaca de la Luna depicts three fields or levels delimited by two ropes caught by mythical characters, thus dividing the world into a tripartite organization (Figure 2), Dolorier Torres and Salazar (2012); Tufinio (2006). Each level of this depicted cosmovision contains different types of human and nonhuman actors. These figures serve as important visual markers for the kinds of activities practiced in each sphere. This tripartite structure defines distinct levels and orientations, such as superior-inferior, above-below, left-right, Franco Jordán (2016). Guaman Poma de Ayala [1615] 2009 records the Inca cosmological concept of *pacha* that refers to notions of the world, plane or spatio-temporal contexts<sup>2</sup>. Distinct narratives were associated with human and nonhuman figures in each *pacha* that reinforced the cosmogonic world (origin and foundation) and cosmology (order and structure), Franco Jordán (2016). The upper world (*hanan pacha*) is associated with deities, the middle world (*kay pacha*) is associated with the human world and the underworld (*uku pacha*) is associated with the deceased. Behavioural characteristics of different animal species during daytime and night-time structured the relationship of Moche elites and the natural world in distinct ways. Human ritual sacrifices at Moche ceremonial centres integrated the assistance of animals depending on the purpose of a ceremonial event, Bourget (2001a). In the nocturnal world, bats, both in natural form and as anthropomorphized avatars, could have been valued as important figures dwelling in darkness as interlocutors with the realm of the dead.

<sup>2</sup> It is important recognize the Inca and colonial historical contexts of the meaning and use of the concept *pacha* is not mobilized to reduce or essentialize variation in practice and belief nor project these concepts on earlier societies. However, as Franco Jordán (2016) has emphasized, these three “worlds” are connected through ritual practices in the middle world to the sky and the lower world. Therefore, *pacha* encapsulates the notion of distinct cosmological worlds that may be useful in interpreting the role of nonhuman animals in the activities of these different spheres in Moche cosmology.



### 3. Phylogeny, Behaviour and Distribution of Bats in the Americas

Bats are mammals of the order Chiroptera with phylogenetic research placing bats as a sister taxon to carnivores, pangolins, odd-toed ungulates (such as horses), even-toed ungulates (such as camels) and cetaceans (such as whales). In 1758, in his publication *Systema naturae*, Carl Linnaeus removed bats from the class Aves and placed them in Mammalia. This change highlighted the shifting observations of mammalian characteristics, with previous scholarship emphasizing vertebrate flight exclusively to birds. However, the taxonomic criteria of mammals include characteristics of placental birth and nursing that required a re-categorization of the order Chiroptera.

As mammals, bats share similar anatomical structures in their overall skeleton yet they have a distinct forelimb modification that enables flight. There is wide variation among the more than 1400 species of bats in wing shape, nose form, ears, teeth, the presence of a tail, legs and eyes. The fur colour of bats can range from the darkest brown to pure white or bright orange. Bats are nocturnal, sleeping in the day and active at night. In the Neotropical lowlands, bats are the single most diverse and abundant order of mammals. Members of the taxonomic family Phyllostomidae include species that illustrate a variety of feeding habits. They can be pollinators, feeding on nectar and pollen (e.g., *Glossophaga*), aiding agricultural crops and forest ecosystems, subsisting on fruit (e.g., *Carollia* and *Artibeus*) acting as vital seed dispersers or eating insects (e.g., *Micronycteris*). Some are even carnivores feeding on small mammals and birds (e.g., *Daemus* and *Diphylla*) and a few species are real-life vampires feeding on the blood of birds and mammals, including larger livestock (e.g., *Desmodus*). Contrary to popular belief, only a few species of bats feed on blood, with this subsistence behaviour facilitated by anticoagulating components in the saliva to permit continuous blood flow. Most bats hang upside-down from branches, in hollows, building overhangs or in caves, where they roost during their daytime sleep and at night when they rest from flying. The roosting of bats in caves creates depositions of useful fertilizers that communities in the past may have exploited and are a resource still widely used today, [Laird \(2018\)](#); [Tuttle \(1984\)](#).

In the Americas, bats species are common throughout the Neotropics, from Mexico to Argentina. [Benson \(1987, p. 166\)](#), notes that bats are not always prominent in the material culture of low altitude societies, despite thriving in ecologies below 2000 m above sea level. Thus, the mere presence of bats does not guarantee their cultural importance to all societies. In the Andes, bats have more commonly been reported below 1800 m above sea level, with fruit and nectar bats the most common taxa, as well as insect consumers (Molossidae and Phyllostomidae); the vampire bat is much rarer and dependent on the number of domestic livestock, [Graham \(1983, p. 570\)](#); [McNab \(1982, p. 191\)](#); [Tuttle \(1970, p. 570\)](#). In the desert North Coast of Peru, the Common Vampire Bat (*Desmodus rotundus*) subsists on sea birds while living in this arid environment, as well as domestic livestock, [Tuttle \(1970, p. 54\)](#). The phylogenetic relationship between bat species and with other animal groups is organized by the Linnaean tradition in academia, which differs from many cultures around the world. To explore the variation of bat depictions, it is necessary to discuss the ways that non-Western classification systems order the animal world. The organization of bats in relation to other types of animals can reveal the shared characteristics with other non-human beings.

### 4. Folk Taxonomies and Symbolic Classification

Analysis of animals in material representations varies depending on how such depictions are ordered, classified and interpreted. These aspects can also include the portrayed relationship of animals with humans, other animals, plants and other beings in different material media. Beyond the physical description of these animals, the practices of ordering the world also depends on the worldview and on daily practice varying with the objects and animals with which one interacts [Zedeño \(2009\)](#). Therefore, context and materiality are the essential components of animal depictions and permit us to comprehend how different non-human beings, including bats, may have held specific roles and values in past cultures.

Emic perspectives of organizing the non-human world can be difficult to assess from the archaeological record, however ethnographic scholarship has identified and defined cultural structures that can make sense of these worldviews. Among the Nage of Indonesia, [Forth \(2009\)](#) investigates how the bat is situated peripherally in folk taxonomy and symbolic classification. Bat activities overlap with nocturnal raptors that could relate these groups of animals through their common mobility of flight and night-time subsistence, yet there is a differential value attached to both nocturnal and diurnal birds of prey. In order to distinguish folk taxonomies from symbolic classification systems, [Forth \(2009\)](#) mobilizes the concepts of “general purpose” and “special purpose” classifications, [Berlin \(1992\)](#). For [Forth \(2009, p. 139\)](#), “ethnotaxonomy (or folk taxonomy) refers to a society’s general-purpose classification, while one variety of special-purpose classification is symbolic classification”. More specifically, folk taxonomies have general-purpose traits in their classification structure that can be broadly associated with scientific taxonomy. In contrast, symbolic classification is related to the way that biological categories defined by folk ideas are associated or disassociated in their symbolic use, such as in belief, myth and metaphor, [Forth \(2009, p. 140\)](#). Despite their differences, ethnotaxonomy and symbolic classification are grounded in natural empirical features, with symbolic classification incorporating these characteristics more selectively.

The separation of ethnotaxonomy and symbolic classification aims to identify the different configurations of cultural meanings behind the categories of different life-forms. [Zedeño \(2009\)](#) also highlights the importance of defining the nuances of classification systems in her analysis of relational taxonomies that account for the physical objects in material assemblages but also the context in which these objects are used. The central role of some taxa and the peripheral representation of others differentiate the valorisation and symbolic meaning of specific animals. In the case of the Nage, the central role of birds is related to the behavioural traits of diurnal raptors. However, in Nage folk taxonomy, nocturnal raptors are peripheral, [Forth \(2004, 2009\)](#). The various species of bats that the Nage have knowledge of are all “peripheral to the life-form category of ‘bird’”, [Forth \(2009, p. 142\)](#). The common characteristics of flight links birds and bats, but the nocturnal activities of bats situate them peripherally in Nage classification schemes and worldview. However, this categorical status does not relegate this animal as unimportant or symbolically irrelevant.

The symbolic importance of bats can be seen throughout the Americas, [Benson \(1987, 1997\)](#); [Brady \(2019\)](#); [Brady and Coltman \(2016\)](#); [Navarro and Arroyo-Cabral \(2013\)](#). A well-known example is from the Maya *Popol Vuh*, which recounts twins Hunahpu and Ixbalanque spending a night in a bat house where Hunahpu is beheaded by Camazotz (The Bat of Death), [Benson \(1987\)](#). In various parts of the world, caves have affiliations with ancestors as well as with the underworld and rebirth. Bats can be economically significant for the guano that they produce, which is a valued agricultural resource. They can also be desired for their fur. Records from the colonial Andes mention bats in relation to finely dressed elites. For instance, [Cobo \[1653\] 1979, p. 245](#) describes a Spaniard inquiring about the fabric used to make Inca Atahualpa’s clothes that he noticed seemed softer than silk; Atahualpa responds, “that they were made from the birds that fly about at night in Puerto Viejo and Tumbes and bite people” (also quoted in [Benson 1987](#)).

In the Andean context, the symbolic role of animals is evident in daily practice, ceremonial animal offerings and in their depiction in material culture. The Indigenous concept of perspectivism contends that humans and animals perceive the world equally as calculating subjects, [Viveiros de Castro \(1998, 2004\)](#). This perception is determined by the unique bodies of distinct species, such that the jaguar sees blood as beer and in turn sees humans as jaguars based on the notion of multinaturalism. The parallel needs and activities of subsisting and interacting with other members of a species enable different groups of animals to have perspectives on their own environments. In the case of bats, their perspective in flight, in nocturnal environments, in their perching habits in caves and in thatched overhangs may have been features that fascinated Moche artisans and those elites commissioning the production of visual material culture.

In Moche scholarship, the parallel role that animals play for elite activities and sacrifice have been identified in the Deer Hunt scene. [Donnan \(1997\)](#) identifies a metaphoric relationship between the

Moche deer hunt and the capture of human prisoners. However, questions still exist in terms of how to distinguish between metaphoric visual representation and evidence of animistic ontology within the Moche context, [Trever et al. \(2009\)](#). Bats are present in material culture from the early contexts of the Chavín cultural sphere (1500 BCE) to Chimú material culture (CE 1400). These depictions may have been important for ceremonial practices, but a systematic study of the varied images of these animals is required to avoid misconceptions about their role and status in both past and present cultures.

## 5. Chiroptera in Moche Contexts and Material Culture

Animal depictions in Moche material culture were produced on ceramic, metal, bone and plaster (wall murals). Moche animal depiction in fineline and figurative iconography has not been systematically researched. Despite the lack of systematic focus on animals, scholars have proposed many interpretations about key iconographic depictions involving ceremonial procession, elite burial and hunting, [Bourget and Jones \(2008\)](#); [Donnan \(1978\)](#); [Donnan and McClelland \(1979\)](#); [Pillsbury \(2001\)](#); [Trever \(2019\)](#). Early work on Moche iconography has emphasized that these depictions were important aspects of materializing religious and political beliefs throughout the Moche period (CE100-850), [Billman \(2002\)](#); [DeMarrais et al. \(1996\)](#); [Donnan \(1992\)](#); [Gölte \(2009\)](#); [Hocquenghem \(1987\)](#). [Donnan \(1978, 1992\)](#) extensive work on Moche visual media reveals that there were limited numbers of scenes and actors, which he refers to as “themes.” [Quilter \(1997\)](#) undertook seminal work on Moche iconography by proposing a narrative theory, arguing that a set of key figures are repeated throughout various scenes to establish specific storylines about supernatural and elite characters.

Lavish burials uncovered at the sites of Sipán in the Lambayeque Valley and San José de Moro in the Jequetepeque Valley provide archaeological evidence for Moche iconographic themes identified by Donnan and others. These burials contain elite interments dressed in ritual regalia and costumes with associated ceremonial paraphernalia, [Alva and Donnan \(1993\)](#); [Donnan \(1992\)](#); [Swenson \(2006\)](#). From this archaeological evidence, 11 figures from Moche iconography have been identified, [Bourget \(2006\)](#). The direct association between Moche depictions and burial practices indicate that the iconographic record is an important source of information about real-life practices and rituals. The understudied yet abundant animal depictions also provide a window into Moche practices and ideologies.

Zooarchaeological remains of bats in Moche contexts are rare. Chiropteran skeletal remains are fragile and often difficult to identify. However, bat remains may not have been offered for different mortuary or ideological reasons. One exception exists from the site of Huacas de Moche in the Moche Valley, [Chaucat and Gutiérrez \(2006\)](#); [Goepfert \(2008, 2011, 2012\)](#). The remains of a vampire bat (*Desmodus rotundus*) were recovered from Tomb 4 of the Uhle Platform that had been placed below the layer of adobe that sealed this burial, [Chaucat and Gutiérrez \(2006\)](#). The vampire bat is a common species found throughout South America and known for its blood-feeding behaviour, [Eisenberg and Redford \(1999\)](#). The bat remains from Tomb 4 were not directly associated with the human burial but found higher in the stratigraphic sequences, contrasting with animal offerings found in other Moche tombs, [Goepfert \(2012\)](#). The archaeological evidence of bat use is limited, but the iconographic records provide dozens, if not hundreds of depictions that indicate specific types of associations of bats with subsistence activities and ritual practices.

This investigation analyses bat images from 61 ceramic vessels of the Larco Museum in Lima, Peru and three fineline iconographic images of the Dumbarton Oaks Collection in Washington DC available through online catalogues. It also considers in-situ evidence from the site of Dos Cabezas in the Jequetepeque Valley and the depiction of a bat figure in the Pañamarca Mural in the Nepeña Valley (Figure 1). There are thousands of Moche vessels in museums and private collections from all over the world, so this analysis is not exhaustive, but exploratory. These museum collections were compiled in the early 20th century by Peruvian and foreign collectors who were interested in the well-crafted and visually stunning ceramic, metal and textile artifacts produced by pre-Columbian societies. Artifacts in museum collections were amassed by subsistence diggers, donors, patrons and researchers of their eras. Therefore, the social morals and political interests of scholars of the early 20th-century influenced

the curation of different kinds of depictions. Wołoszyn and Piwowski (2015) discuss depictions of bestiality described by Tello (1909, p. 43) and Valdizan (1915, p. 82). Today, many of these depictions are not present in Moche collections indicating the practice of destroying many erotic pots because of the societal belief that these kinds of portrayals were morally inappropriate.

The 61 vessels analysed from the Larco Museum display good preservation of ceramic material and pigmentation that highlight features of the vessels and bat portrayals. Many vessels depicting bats from the Larco collection may be from the southern Moche sphere, so stylistic analyses and interpretations need to be qualified with this regional bias in mind. Only 12 vessels have provenience information indicating that various artifacts were recovered from the Chicama, Virú, Moche and Santa Valleys. These vessels all originate from looted mortuary and tomb contexts, Bourget (2001a, 2001b); Donnan (2007); Weismantel (2018). The iconographic depictions from the Dumbarton Oaks Collection do not have provenience information for the bat images that were analysed for this investigation.

Bat depictions were examined through photos and drawings available through the online catalogues of the Larco (N = 61) and Dumbarton Oaks collections (N = 3) (Table A1, Appendix A). Each object was examined for the presence and number of bat depictions. Vessel type, naturalized or anthropomorphized figure, and other associated beings or objects were categorized for each artifact. The function of each vessel was categorised and the family or genus of naturalized bat depictions was defined where possible. A total of 64 objects were examined, identifying 66 bat figures.

Moche material culture displays bats in various artifact types and as different figurative forms. The style of bat depictions are categorised into two principal forms: (1) anthropomorphized figures and (2) naturalized forms. Anthropomorphized bats (32/64) are represented on tops of globular bases or form the entire figure of the vessel produced from a mould (Figure 3). These portrayals include bats with vessels, clubs and human figures. Stylistically, the main features of these bat portrayals are highlighted with bichrome red and crème pigment, defining borders of ears, wings and clothing. In zoomorphic depictions, bats are highly recognizable to genera or species. These naturalized portrayals include fruits that identify the feeding practices for some taxa. Naturalized bats usually do not have bichrome pigment emphasizing bat characteristics in their depictions, instead, crème slip is more commonly used. Most of the vessels that depict bats are stirrup jars (35/64). They have globular bases painted with bichrome pigment displaying bat figures carrying vessels. Stirrup jars are known as elite vessels that may have contained liquids including water and possibly *chicha* (or corn beer). Within the assemblage of stirrup jars, there are two pots that are defined as “whistling jars”; air passing through the stirrup spout into the main chamber produces a whistling sound.



**Figure 3.** Anthropomorphized bats holding different vessels: (A) bat holding a stirrup jar and flaring bowl (ML003458); (B) bat holding *canchero* (or dipper) and *florero* (ML003474); (C) bat carrying two *ollas* (domestic pots) on shoulders (ML003456); (D) bat holding two stirrup jars, one in the form of a duck (ML003484) (Museo Larco, Lima—Perú).



Bat images are depicted as figures on *cántaros* (serving jars) (7/64), *cancheros* (constricted bowls with elongated handles, or dippers) (4/64), miniature *cántaros* (8/64), bowls (2/64), whistles (2/64), molds (2/64) and metal (1/64) objects as well as in fineline (3/64) (Figure 4). In the three fineline scenes from the Dumbarton Oaks collection, five bat figures are depicted in proximity to different vessel types, including stirrup jars and flaring bowls (including *floreros*). This diverse range of material culture, encompassing clay and metal resources, indicates that the image of the bat is displayed in various media.



**Figure 4.** Vessels that have depictions of bats: (A) *cántaro* with bat snout and ears along the neck (ML012348); (B) *canchero* with a bat head at the end of the handle (ML006401); (C) bowl as a bat with the opening in the lower abdomen (ML008254); (D) whistle depicting bat holding bag and stirrup jar (ML014407) (Museo Larco, Lima—Perú).

Bats are most recognizable for their characteristics of distinct wings, teeth, ears and legs, where wings are present with one or more of these other features (38/66). There are various depictions where bats wings are not portrayed but the ears, snout and teeth are diagnostic of chiropteran species (23/66). Bats are represented in naturalized form (34/66) but also as anthropomorphized figures (30/66). The naturalized depictions include specific details from identifiable taxonomic families, such as Molossidae (Figure 5A–C) and Phyllostomidae (Figure 5D,E), [Baker et al. \(2009\)](#); [Hoffmann and Baker \(2003\)](#); [Vaughn \(1966\)](#); [Velazco and Kline \(2019\)](#); [Zamora et al. \(2014\)](#). Bats are also depicted lying on fruits, possibly from the plant family Rosaceae, which has been recovered from stomach contents of nectar-feeding bat species, such as *Glossophaga soricina*, in the National Park Cerros de Amotape in Tumbes, in northern coastal Peru, [Arias et al. \(2009\)](#). The depictions of bats on fruit or out-stretched wings on globular bases mimic the physical characteristics of Molossidae, the fourth-largest family of bats. The large ears of several images suggest the family Phyllostomidae, with possible genera *Lophostoma* or *Micronycteris*. Both families are insectivores, capturing insects off the ground or from vegetation. It is further interesting to highlight that both families can roost in buildings, such as in thatched roofs. These roof buildings and overhangs are depicted in iconographic scenes of sacrifice. These ceremonial activities could have possibly been undertaken when bat roosting was occurring in these structures.



**Figure 5.** Naturalistic depictions of bats in stirrup jars: (A) bat on fruit with smooth skin, Molossidae (ML007237); (B) bat on fruit with protrusions on skin, Molossidae (ML007349); (C) bat on globular base, Molossidae (ML009873); (D) bat with flared wings, Phyllostomidae (ML008255); (E) bat with flared wings, Phyllostomidae, possibly genus *Lophostoma* or *Micronycteris* (ML014246) (Museo Larco, Lima—Perú).

Anthropomorphized bats are depicted in association with human figures (11/64). These portrayals are primarily of humans as prisoners, sacrifices and even children (Figure 6A). There are also depictions of bats that are larger than human figures grasping a rope that is tied around the neck of a prisoner (Figure 6B). The bats in these depictions are typically grasping the human figure in one hand (always larger than the person) and holding a club, shield or a *tumi* (sacrificial knife) in the other (11/64) (Figure 6C). There is also one depiction from the Larco collection portraying a copulation scene between a bat and a human figure (Figure 6D).

The most common items depicted with bats are ceramic vessels. These vessels include *ollas* (domestic pots), stirrup jars, *cancheros* and *floreros* (15/64). The Dumbarton Oaks Collection has two depictions of bats with these vessels (Figure 7). The function of these vessels varies, with *ollas* used in daily domestic activities, *cancheros* serving to heat maize and other cultigens and stirrups jars along with *floreros* having more elite and ceremonial association, [Donnan and McClelland \(1999\)](#).

The 61 vessels from the Larco Museum in Lima and the three fineline scenes from the Dumbarton Oaks Collections highlight that bats—despite their less common depictions vis-à-vis birds, such as the owl, or carnivores like jaguars and foxes—were portrayed as assistant figures in sacrificial activities. They were also emblems of agricultural fertility because of their role in plant pollination, the use of their guano and their behaviour of perching in caves connecting to the ancestral world. Bats could have even served as symbols in the elite consumption of liquids from certain vessels depicting them with serving vessels used in feasting events. This strong affiliation with vessels could have held importance for the bats themselves being vessels or containers, [Bourget \(2006\)](#). As liminal animals living in caves, perching upside-down and exchanging vital substances, including pollen and blood, the bat corporeal form could have been understood as an analogy to ceramic vessels that may have contained the product of these substances, such as *chicha*, water or blood.



**Figure 6.** Anthropomorphic bats with human figures and weapons: (A) bat figure with *tumi*-shaped headdress holding a club and person (ML003480); (B) large bat figure with half-moon headdress holding a large club and rope tied to a person's neck (ML003478); (C) snarling bat figure with *tumi* knife and decapitated head (ML010854); (D) bat figure on top of a person with ear spools (ML004367) (Museo Larco, Lima—Perú).



**Figure 7.** Anthropomorphic Bat and a Variety of Vessels. Dumbarton Oaks Research Library and Collection, The Moche Archives, Drawn by Donna McClelland (Image ID 17149312).

## 6. Artwork and the Materiality of Vessels

The new-found interest in materiality theory in archaeology has relevance for the types of material culture analyses that are conducted globally, [Clark \(2009\)](#); [Meskell \(2004\)](#); [Nanoglou \(2008\)](#); [Weismantel and Meskell \(2014\)](#). Material culture studies have struggled with relegating utilitarian artifacts to quotidian functions and art to aesthetics or ritual. [DeMarrais and Robb \(2013\)](#) provide a compelling set of approaches to examining art as not solely aesthetic but art as “doing”, and thus acknowledging

this material culture as *artwork*. They consider art as a medium for shared interaction, creating and/or asserting representational models, cultural capital and exclusion, [DeMarrais and Robb \(2013\)](#). In Moche material culture, chiropteran species are related to the functional and symbolic meaning of clay pottery vessels and other resources. These vessels were part of activities involving filling and emptying important liquids and using bat images on these containers associated the chiropteran image with practices of production and consumption. It is in the “doing” of artwork in daily and ceremonial practices where bats are signified as non-human beings recognized by the Moche to have their own intentions and importance in the relational schemes of agricultural renewal and sacrificial events.

When the plethora of animal images are considered, the proportionally fewer images of bats in Moche iconography may signify their peripheral role in Moche ethnotaxonomy. However, as [Forth \(2009\)](#) emphasizes, the peripheral position of certain ethnotaxa does not mean that they were unimportant; instead, they may have fulfilled different roles than other animals in a specific ethnotaxonomy. Bats’ peripheral place in the Moche ethnotaxonomic system also does not necessarily mean that they were tabooed animals, as erroneously interpreted by [Needham \(1979\)](#) of [Douglas \(1966\)](#) examination of the Old Testament. Among the Nage, [Forth \(2004, 2009\)](#), it is ironic that bat symbolism is abundant, but they are excluded from Nage symbolic classification. Bats in Moche iconography are not ironic because they are not as widely depicted as other wild animals, including jaguars and owls. However, they have similar traits to other taxa (i.e., birds) and were marginal to ethnotaxonomic classification. They formed part of a repertoire of symbolic associations essential to daily and ceremonial practices, the perpetuation of agricultural prosperity and maintaining the interconnection between the *pachas* (an Inca concept defining a tripartite organization of the cosmos).

In the Moche archaeological record, there are two well-known contexts where bat images have specific mortuary and sacrificial importance. At the site of Dos Cabezas in the Jequetepeque Valley, [Donnan \(2007\)](#) uncovered “Bat Decapitator” images with headdresses and bat-nose pieces from Tomb 2, a rich mortuary context with copper and other metal artifacts. [Benson \(2012\)](#) notes that like owls, bats are nocturnal and have shamanic meaning often associated with death. Anthropomorphic bat images may be principal guardians of funerary ceramics because of their association to these vessels in depictions, but the features of bats in the Presentation Theme scenes suggest that they were not central deities like the Plate-shirt-God, instead, serving a secondary role, [Benson \(2012, p. 76\)](#). Tomb 2 contains ceremonial paraphernalia including fine weaponry, such as clubs, spears, spear-throwers and gold-plated shields. These burial goods in conjunction with bat images reinforce the warrior and priestly identity of the interred lord of Tomb 2, [Benson \(2012\)](#); [Donnan \(2007\)](#).

Beyond tomb contexts, mural constructions also indicate that bats played an important role in ceremonial and sacrificial processions. In the Nepeña Valley, at the site of Pañamarca, Mural E depicts a bat in a Sacrifice Ceremony scene holding a ceremonial cup (or goblet) that may have been filled with vital liquids, such as blood, [Earle \(2010\)](#); [Trevor \(2013, 2017\)](#) (Figure 8). [Benson \(1987, p. 169\)](#) argues that bats have many features that can be related to sacrifice, death and the underworld. Other accompanying figures in this Sacrifice Ceremony scene also include an anthropomorphic fox and a priestess figure holding goblets. Fox and bat images both have predatory meanings and their role as assistants to a priestess figure emphasizes ceremonial processions and sacrificial practices. Moche priestesses have lunar affiliations that situate the female form in a pan-Andean dualism structuring man/woman and day/night as binary complements. Therefore, this female priestess character is associated with lunar symbols and aligns with many of the biological and behavioural characteristics of bats. By fitting into the possible dualistic structure of the Moche worldview, bats were significant in elite practices and as symbols of complementarity among gender and cosmological binaries.

The relational importance of bats in these mortuary contexts highlights their association with warfare and sacrifice. Bats were key attendants in ceremonial activities that demonstrate their role as essential figures for the successful practice of Moche religion. [Bourget \(2006\)](#) argues that bats in depictions with vessels, including stirrup jars that are often defined as funerary objects, were emptying these vessels, possibly in practices of consumption. The vessels that contain bat images in Moche



material culture both depict and consist of daily serving or storage vessels as well as elite mortuary burial goods. *Ollas* are domestic pots employed in the preparation of daily and ritual meals, with many vessels uncovered with charred bases. The various vessels from the Larco Museum indicate that bats were associated with the form and possible function of *ollas* in specific contexts. It is not possible to assert that bats had mundane or domestic affiliations, but it is important to highlight the possible protective role that bats may have held for certain communities or specific groups in society. At Dos Cabezas, [Donnan \(2007\)](#) argues that bat images in Tomb 2 served as guardians protecting funerary ceramics due to their association with warrior weapons, but this does not preclude the protective aspects that bats could have had in other contexts. Bat depictions on stirrup jars, *cancheros* and *floreros* indicate that bat images are present during elite and mortuary activities. The presence of bats on vessels used for domestic and ceremonial activities demonstrate their contextual versatility in meaning for daily practice and cosmological reinforcement. A relational taxonomy, as [Zedeño \(2009\)](#) emphasizes, may provide a useful paradigm to interpret past practice and belief due to the dependence of meaning on the biological characteristics of different animal species and how these traits are observed and valued in distinct worldviews.



**Figure 8.** Bat attendant holding a ceremonial cup in Mural E at Pañamarca (Courtesy of Lisa Trever).

The act of emptying a ceramic vessel involves inverting the object, an orientation that parallels bat behaviour. Bats roost upside-down both during sleep but also while resting from flight. This specific behaviour was possibly observed by artisans that accounted for these characteristics in the production and use of ceramic and metal artifacts commissioned by elite patrons. Furthermore, artisans were conscientious of the function and context of use for ceramic vessels and therefore the upside-down orientation of bats depicted in these containers was part of the symbolic meaning in their portrayal. [Benson \(1987, p. 169\)](#) points out that “death-associated, sacrificial and chthonic symbolism of bats is related to hanging upside-down, facing the Underworld; they often reside in caves, which are usually considered entrances to the earth or Underworld”. There is not simply a negative connotation to this affiliation with death and sacrifice, but much of this imagery also connotes regeneration and rebirth. In the worldview of many pre-Colonial cultures, the underworld (or *uku pacha*) was not only where the dead go but also from where plants derive, [Benson \(1987\)](#).

The hundreds of bat species in the Americas subsist on fruits and insects, which would have facilitated pollination of many plants. This association between fertility and renewal of the bat seems to further relate to the sacred *Ceiba* tree, or calabash, [Lathrap \(1977, p. 730\)](#), which is dependent on the subfamily Glossophaginae, a group of nectar and pollen-eating bats, [Allen \(1939, pp. 112–19\)](#); [Benson \(1987, p. 170\)](#); [Heithaus \(1982, p. 331\)](#); [Janzen \(1983\)](#); [Villa-R. \(1966, p. 21\)](#). Both the leaf-shaped nose of fruit-eating bats along with the production of fertile bat guano and its use in agriculture further reinforced this symbolism, [Benson \(1987\)](#). The Moche were effective in producing surpluses in agricultural crops that included maize, bean and squash cultigens. By maintaining large agricultural landscapes, bats would have been observed and recognized as an important aspect of the natural lifecycles of plants and their temporal association to seasonal change. These relationships with subsistence success and community prosperity therefore placed bats in the role of an assisting species for daily practices. It is the relational meaning of bats as both pollinators of important and sacred plant taxa and their orientation towards the underworld that places bats as species that can connect the *uku pacha* with the earthly (*kay pacha*) and the supernatural spheres (or upper world) (*hanan pacha*). Bats are thus symbolically linked to vegetation through root systems, stalks of plants and trunks of trees that interconnect the cosmological planes of the *pachas*, along with cycles of destruction and renewal.

Animal communication sounds can signal to human societies the arrival of dawn or dusk, as well as seasonal changes. The way that sonic frequencies are interpreted from these non-human groups can also be related to their symbolic meanings. Bats see well and orient both by sight and navigate using echolocation ([Laird 2018](#)). For the Moche, they may have wondered about the method of nocturnal navigation of bats, in which a cloud of bats creates an impactful auditory phenomenon. Echolocation is typically ultrasonic so bat sounds that people could hear were audible communication chirps and wing flapping. [Benson \(1987, p. 170\)](#) notes that the species *Tadarida brasiliensis* departs caves at dusk in such large clouds that it mimics the sound of rushing water, and in some formations, with their speed of flying, even looking like smoke, [Rodríguez de la Fuente \(1978, p. 86\)](#). In Moche ceramic vessels, bats are depicted as whistles and as whistling stirrup jars (Figure 4D). This is an interesting alignment between the depiction of the bat form and their communicative capacity. The auditory association of bats celebrated in Moche artwork may further their metaphoric link to air, spirits and the *pachas*, [Bourget \(2001b\)](#); [La Chioma \(2019\)](#).

The association of music in mortuary rites, ancestors and children is widely acknowledged in the Andes. [Bourget \(2001b\)](#) addresses the meaning of whistling and the ritual use of children by many figures in Moche artwork. It has been interpreted that anthropomorphized bats of both sexes are depicted carrying children, which is associated with ritual bleeding and sacrifice by decapitation, [Bourget \(2001b\)](#). This connection between children and bats highlights the symbolic and liminal state of both. Children may have been essential participants in ceremonial practice for linking the living with ancestors and maintaining the cycles of destruction and renewal, arguably acting as vital seeds, [Alaica et al. \(2020\)](#); [Sillar \(1992\)](#); [Swenson \(2018\)](#). The depiction of bats and children together suggests their important mediating role in fertility rituals and lifecycles.

The sacrificial connotation of bats is related to ceremonial events for mediating power structures but also to reinforce societal beliefs about cosmological renewal. The agricultural importance of bats both on a practical and cosmological level is related to blood sacrifice, as blood was a vital fluid revered by Moche ritual practitioners. [Benson \(1987\)](#) draws from the research of various scholars working in lowland communities and the folklore that associates bats with sex, relating both fertility and agriculture. For instance, the Desana of the northwest Amazon region associate the bat with the vagina, [Reichel-Dolmatoff \(Reichel-Dolmatoff 1971, p. 1010\)](#) and the Yupa recount stories of a hunter transformed into a bat after he is seduced by a female bat. The hunter's wife eventually sets fire to a tree, killing her husband along with the bats, [Wilbert \(1974, pp. 122–23\)](#). The sexual association to bats and their relationships to cycles of destruction and renewal seem to parallel the Moche worldview. An example of copulation between a bat and a human figure (Figure 6D) reiterates this connection to sexual exchanges, however, these depictions are not common. Interestingly, in this example, the form

of the vessel is distinct from other Moche bat portrayals, where instead of a stirrup jar or *cántaro*, the vessel is an open bowl.

Seasonal and climatic cycles were experienced regularly by pre-Columbian populations of the coastal Andes. The North Coast of Peru witnessed and continues to experience cycles of destruction and renewal with hydrological and climatic fluctuation that creates complex practical and symbolic relationships with water. The Moche vessels that both depict watery entities and contain it, composing the two sides of Moche nature-culture (argued by Weismantel 2018, from Haraway 2003). Weismantel and Meskell (2014, p. 243) emphasize how “water was a tightly controlled substance, and so too was the making, circulation and deposition of Moche fine ceramics—objects designed to mimic, but also to reproduce, the controlled movement of liquid through the landscape—and the body”. The separation of sacred and profane is foreign to indigenous thought in the Americas and therefore the use and meaning of animals in daily and ceremonial activities would take a multitude of meanings depending on the context, Weismantel (2018). The relational meaning of the material culture depicting animals needs to become a central focus of archaeological analyses because it permits the discussion to shift from aesthetics to “doing”. This exercise is not reductively functionalist but intends to generate strong interpretations that reveal more about practices and beliefs situated in the ecologies and landscapes of past societies.

## 7. Nocturnal States, Inverted Forms and Redefining Connotations

Moche material culture depicts bats in association with sacrifice, fertility and pollination. Contemporary popular culture places a reductively negative connotation on bats that can prevent critical investigation of their representation and meaning in the past. Many scholars have rightfully opened the conversation around the ways that bats could be both dark and chthonic but also essential to processes of renewal and regeneration, Benson (1987); Laird (2018). These simultaneous meanings emphasize the different worldviews that may have been held by pre-Colonial communities of the Andes, in which life and death were parts of necessary cycles.

Bats roosting upside-down in caves accumulate fertile guano that may have been used by Moche agriculturalists in tandem with advanced hydrological constructions to produce key cultigens for daily meals and large-scale feasts. Caves are also liminal places for connection between middle world (*kay pacha*) and underworld (*uku pacha*), two spheres in Moche cosmology that relate to the world of the living and the world of the dead. The circulation of air and liquids between these *pachas* may have been understood by Moche religious specialists to perpetuate the agricultural lifecycles of plants and animals. The use of guano both in its chemical fertility but also in its relation to the transitional threshold of caves could have been a vital substance for agricultural practice. Furthermore, the offering of blood, water and *chicha* may have also sustained the cycles of renewal for successive generations. The bat as both a part of the natural world and human taskscapes is encapsulated in Moche iconography as a zoomorphic image and anthropomorphized being.

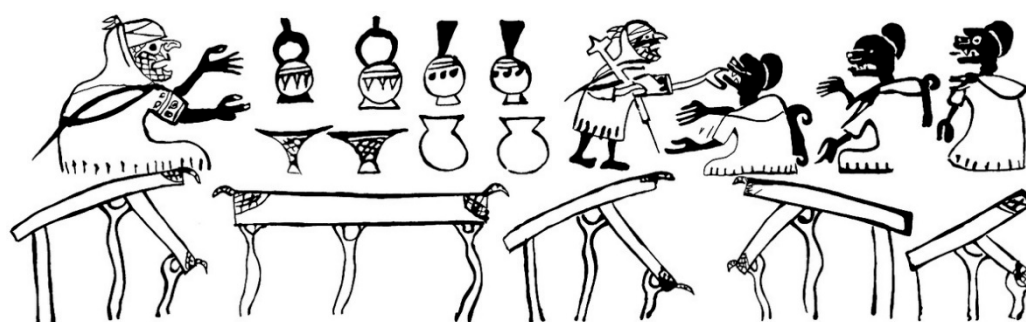
There are similar proportions of zoomorphic depictions and anthropomorphized figures of bats in this analysis of Moche iconography from the Larco Museum and Dumbarton Oaks Research Library and Collection suggesting that the bat held significance in natural processes and in the daily and ceremonial activities of human communities. The versatile form of the bat provided an artistic template for artisans to utilize diagnostic features of bat wings, ears, teeth and body shape at the commission of elite patrons. These animals were important ceremonial avatars for ritual specialists as well as for assisting principal female priestess figures in ceremonies related to sacrifice, lunar symbolism and environmental instability of El Niño events. In this sense, bats were liminal anthropomorphized beings that had the capacity to cross between *pachas* (or worlds) and ensure the cycles of renewal between the living and the dead.

The nocturnal behaviour of bats places their role in the sphere of night-time darkness, dreamscapes and the moon. During the Moche period, moon worship was related to females, silver, blood and the thorny oyster shell (*Spondylus* sp.), which is structured in complementary opposition to the sun and the male principle, Benson (1985); Cordy-Collins (2001). The famed priestesses of later Moche



depictions have been argued to represent transformations in ritual practice that emerged within the Late Moche Period. Cordy-Collins (2001) argues that the priestesses officiated three interrelated ceremonies: Sacrifice, Tule Boat and Burial. In earlier iconography, female figures are often secondary characters that carry vessels (specifically goblets) for sacrificial blood-letting. The gendered role of women in these ceremonial activities situates sacrifice within the dualistic organization of a pan-Andean world.

The sacrifice, marine and burial ceremonial scenes that involve female characters all have elements that relate to both bat biology and chiropteran iconography in Moche artwork. The Sacrifice Ceremony depicted on the mural at Pañamarca depicts a Moche priestess with a headdress of large plumes accompanied by anthropomorphic assistants, one of which is a bat, Trever (2017). During the Late Moche Period (CE 650–850), the role of the priestess in the Sacrifice Ceremony was to collect blood from bound prisoners using special vessels, Castillo and Holmquist (2000); Donnan (1978, pp. 158–73); Swenson (2012). The Tule Boat Ceremony depicts a reed boat in the shape of a crescent moon. The priestess is dressed similarly as in the Sacrifice Ceremony, but she is not accompanied by prisoners instead with bound jars. Some Tule Boat Ceremony depictions show the priestess using the same goblet as the elite blood-drinkers of the Sacrifice Ceremony and wings of dragonflies, a carnivorous insect, Castillo (2010); Castillo and Holmquist (2000); Cordy-Collins (2001, p. 50). The Burial Ceremony represents the priestess with a dotted cape, also portrayed in the Tule Boat Ceremony. These three ceremonial scenes relate to the nocturnal activity of bats, their association with fertility and the collection and pouring of vital liquids that could have included blood and water. Bats, elite women and lunar symbolism in Moche artwork appear to be intentionally related, where bats could have served as occasional avatars for female figures, such as in the mural at Pañamarca. This association is further reinforced by depictions of vessels, female figures, bats and thatched roofs that commonly cover platform structures used during sacrificial events (Figure 9).



**Figure 9.** Women Gesturing towards Anthropomorphic Bats. Dumbarton Oaks Research Library and Collection, The Moche Archives, Drawn by Donna McClelland (Image ID 19077301).

As mentioned, the representation and meaning of the characters in Moche artwork are ordered around specific types of events, often related to sacrifice and burial. These contextual circumstances place bat images in the scheme of collecting liquids but also of offering them. The function of the stirrup jars, *cántaros* and *floreros* indicates that ceremonial distribution of *chicha*, water or blood mimicked the form and behaviour of chiropteran species. To interpret the pattern of liquid containers and bat images in Moche iconography, the epistemology of past thought and action needs to account for relational contexts. Foucault (1966, p. 80) articulates that the ordering of the world can encompass simple natures (or *mathesis*) but complex natures involve representations that emerge from relational experiences (or *taxinomia*). While a *taxinomia* may incorporate a string of *matheses*, it “also implies a certain continuum of things (a non-discontinuity, a plenitude of being) and a certain power of the imagination that renders apparent what is not, but makes possible, by this very fact, the revelation of that continuity”, Foucault (1966, p. 81). In Moche depictions of the bat, the physical traits and behaviour of these animals could have formed part of the visual and functional *matheses* that created continuity between the chiropteran form and the daily activities of pollination and agricultural prosperity. During ritual events, the larger



repertoire of ceremonial characteristics connected the chiropteran form to practices of sacrifice, death and renewal. The very nature of bat representations was to create a heterotopia of representation, where the liquids that can give life and those that can be taken away are simultaneously in circulation.

## 8. Conclusions

Investigating bats in Moche material culture reveals that the diagnostic physical characteristics and behavioural tendencies of these animals were entwined with the beliefs and practices of Moche culture and cosmology. Bats were understood as important for ecosystems where coastal communities dwelled, providing essential pollination from the consumption of nectar and seed dispersal from eating fruits as well as the guano useful for agricultural fertilizer. These animals were understood as emblems for sacrifice, with the vessels depicting their likeness capable of holding essential daily and ritual fluids. Ultimately, the bat was an important symbol in Moche artwork for the relational meaning connecting its features and behaviours to the cult of the moon and to the burial ceremonies that created and celebrated powerful ancestors. [Sax \(2001\)](#) provides an interesting argument for the diverse meanings of bats in many contemporary societies noting that in China, bats symbolize luck and hope. Laird also notes: “among cultures which venerate ancestral spirits, bats are beloved, while those cultures that assume spirits pass on rather than return inevitably perceive bats as demons”, [Laird \(2018\)](#), p. 83). Bats are not symbolically significant alone but when their depictions are related to their behavioural tendency as pollinators, in their orientation of roosting and in their way of communicating their relational meaning becomes significant.

Bats in Moche material culture are not noteworthy for their mere presence. The depiction of bats permitted Moche ritual specialists and participants to connect various aspects of cultural belief and practice to the chiropteran form. The association of inverted worlds, nocturnal and lunar emblems, whistling, vital fluids and fertility created an interactive meaning around bat images. [Weismantel and Meskell \(2014\)](#), p. 247) emphasize that the “material form and spatial context of Moche effigies embody and enact the connections between biology, society and ecology and between the living and the dead”. It is the relational association between bats and foundational Moche daily and ritual practices that fortified the symbolic role of bats as a species of versatility but also wide-reaching meaning for cycles of renewal.

In the end, the way we investigate the representation and importance of animals in past material culture is often through juxtaposition and relationality. As [Benson \(1987\)](#), p. 175) argues, “the jaguar is a larger, more fearsome predator, a more regal status symbol, and a more prominent shamanic animal, but the bat is of almost equal importance in pre-Columbian iconography. The bat seems more chthonic, more fertility-related, more sinister and mysterious and more multifaceted in symbolic potential.” Instead, as this analysis has shown, not all animals are central to past classification structures, but that their presence is significant through interconnected and relational meanings.

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## Appendix A

**Table A1.** Collection details for analysis of bat images indicating known information on date and provenience.

Museum	Code	Region	Chronology (Larco)	Valley
Larco	ML003452	North Coast	AD1-800	N/A
Larco	ML003453	North Coast	AD1-800	N/A
Larco	ML003454	North Coast	AD1-800	Santa
Larco	ML003455	North Coast	AD1-800	N/A
Larco	ML003456	North Coast	AD1-800	N/A
Larco	ML003457	North Coast	AD1-800	N/A
Larco	ML003458	North Coast	AD1-800	Santa
Larco	ML003459	North Coast	AD1-800	N/A
Larco	ML003460	North Coast	AD1-800	N/A
Larco	ML003461	North Coast	AD1-800	Virú
Larco	ML003462	North Coast	AD1-800	N/A
Larco	ML003463	North Coast	AD1-800	N/A
Larco	ML003469	North Coast	AD1-800	N/A
Larco	ML003471	North Coast	AD1-800	N/A
Larco	ML003472	North Coast	AD1-800	Chicama
Larco	ML003473	North Coast	AD1-800	Virú
Larco	ML003474	North Coast	AD1-800	Moche
Larco	ML003475	North Coast	AD1-800	Virú
Larco	ML003477	North Coast	AD1-800	N/A
Larco	ML003478	North Coast	AD1-800	N/A
Larco	ML003479	North Coast	AD1-800	N/A
Larco	ML003480	North Coast	AD1-800	N/A
Larco	ML003481	North Coast	AD1-800	Virú
Larco	ML003482	North Coast	AD1-800	N/A
Larco	ML003483	North Coast	AD1-800	N/A
Larco	ML003484	North Coast	AD1-800	N/A
Larco	ML003486	North Coast	AD1-800	N/A
Larco	ML003515	North Coast	AD1-800	Santa
Larco	ML004367	North Coast	AD1-800	Moche
Larco	ML006400	North Coast	AD1-800	Virú
Larco	ML006401	North Coast	AD1-800	Virú
Larco	ML006408	North Coast	AD1-800	Virú
Larco	ML006412	North Coast	AD1-800	Virú
Larco	ML007237	North Coast	AD1-800	N/A
Larco	ML007251	North Coast	AD1-800	Chicama
Larco	ML007349	North Coast	AD1-800	Moche
Larco	ML007352	North Coast	AD1-800	N/A
Larco	ML008254	North Coast	AD1-800	Virú

Table A1. Cont.

Museum	Code	Region	Chronology (Larco)	Valley
Larco	ML008255	North Coast	AD1-800	N/A
Larco	ML009753	North Coast	AD1-800	N/A
Larco	ML009873	North Coast	AD1-800	N/A
Larco	ML010854	North Coast	AD1-800	N/A
Larco	ML012348	North Coast	AD1-800	N/A
Larco	ML012456	North Coast	AD1-800	N/A
Larco	ML012473	North Coast	AD1-800	N/A
Larco	ML012634	North Coast	AD1-800	N/A
Larco	ML012635	North Coast	AD1-800	N/A
Larco	ML012812	North Coast	AD1-800	N/A
Larco	ML013189	North Coast	AD1-800	Virú
Larco	ML013197	North Coast	AD1-800	N/A
Larco	ML013198	North Coast	AD1-800	N/A
Larco	ML013527	North Coast	AD1-800	N/A
Larco	ML013529	North Coast	AD1-800	N/A
Larco	ML014111	North Coast	AD1-800	N/A
Larco	ML014246	North Coast	AD1-800	N/A
Larco	ML014407	North Coast	AD1-800	N/A
Larco	ML014460	North Coast	AD1-800	N/A
Larco	ML014465	North Coast	AD1-800	N/A
Larco	ML014466	North Coast	AD1-800	N/A
Larco	ML014822	North Coast	AD1-800	N/A
Larco	ML101468	North Coast	AD1-800	N/A
Dumbarton Oaks	DO17149312	-	-	-
Dumbarton Oaks	DO19077301	-	-	-
Dumbarton Oaks	DO17426842	-	-	-

## References

- Alaica, Aleksa K. 2018. Partial and Complete Deposits and Depictions: Social Zooarchaeology, Iconography and the Role of Animals in Late Moche Peru. *Journal of Archaeological Science: Reports* 20: 864–72. [\[CrossRef\]](#)
- Alaica, Aleksa K., Luis Manuel González La Rosa, and Kelly J. Knudson. 2020. Creating a body-subject in the Late Moche Period (CE 650–850). Bioarchaeological and biogeochemical analyses of human offerings from Huaca Colorada, Jequetepeque Valley, Peru. *World Archaeology* 52: 49–70. [\[CrossRef\]](#)
- Allen, Glover Morrill. 1939. *Bats*. Cambridge: Harvard University Press.
- Alva, Walter, and Christopher Donnan. 1993. *Royal Tombs of Sipan*. Los Angeles: Fowler Museum of Cultural History, University of California.
- Arias, Edith, Richard Cadenillas, and Vítor Pacheco. 2009. Dieta de Murciélagos Nectarívoros del Parque Nacional Cerros de Amotape, Tumbes. *Review of Peruviana Biology* 16: 187–90. [\[CrossRef\]](#)
- Baker, Robert J., Molly M. McDounough, Vicki J. Swier, Peter A. Larsen, Juan P. Carrera, and Loren K. Ammerman. 2009. New Species of Bonneted Bat, Genus *Eumops* (Chiroptera: Molossidae) from the Lowlands of Western Ecuador and Peru. *Acta Chiropterologica* 11: 1–13. [\[CrossRef\]](#)
- Bawden, Garth. 1996. *The Moche*. Oxford: Blackwell.

- Benson, Elizabeth P. 1985. The Moche Moon. In *Recent Studies in Andean Prehistory and Protohistory*. Edited by D. Peter Kvietok and Daniel H. Sandweiss. Ithaca: Latin American Studies Program, Cornell University, pp. 105–44.
- Benson, Elizabeth P. 1987. Bats in South American Iconography. *Andean Past* 1: 165–90.
- Benson, Elizabeth P. 1997. *Birds and Beasts of Ancient Latin America*. Gainesville: University Press of Florida.
- Benson, Elizabeth P. 2012. *The Worlds of the Moche on the North Coast of Peru*. Austin: University of Texas Press.
- Berezkin, Yuri E. 1980. An Identification of Anthropomorphic Mythological Personages in Moche Representations. *Nawpa Pacha* 18: 1–26. [[CrossRef](#)]
- Berlin, Brent. 1992. *Ethnobiological Classification: Principles of Categorization of Plants and Animals in Traditional Societies*. Princeton: Princeton University Press.
- Billman, Brian R. 2002. Irrigation and the origins of the Southern Moche state on the north coast of Peru. *Latin American Antiquity* 13: 371–400. [[CrossRef](#)]
- Bourget, Steve. 1994. Los Sacerdotes a la Sombra del Cerro Blanco y del Arco Bicéfalo. In *Revista del Museo de Arqueología, Antropología e Historia No. 5*. Trujillo: Facultad de Ciencias Sociales, Universidad Nacional de Trujillo, pp. 81–125.
- Bourget, Steve. 2001a. Rituals of Sacrifice: Its Practice at Huaca de la Luna and Its Representations. In *Moche Art and Archaeology in Ancient Peru*. Edited by Joanne Pillsbury. New York: Yale University Press, pp. 89–110.
- Bourget, Steve. 2001b. Children and Ancestors: Ritual Practices at the Moche Site of Huaca de la Luna, North Coast of Peru. In *Ritual Sacrifice in Ancient Peru*. Edited by Elizabeth P. Benson and Anita G. Cook. Austin: University of Texas Press, pp. 93–118.
- Bourget, Steve. 2006. *Sex, Death and Sacrifice in Moche Religion and Visual Culture*. Austin: University of Texas Press.
- Bourget, Steve, and Kimberly L. Jones. 2008. *The Art and Archaeology of the Moche: An Ancient Andean Society of the Peruvian North Coast*. Austin: University of Texas Press.
- Brady, James E. 2019. Evidence of Bat Sacrifice in Ancient Maya Cave Ritual. *Archaeological Discovery* 7: 84–91. [[CrossRef](#)]
- Brady, James E., and Jeremy D. Coltman. 2016. Bats and the Camazotz: Correcting a Century of Mistaken Identity. *Latin American Antiquity* 27: 227–37. [[CrossRef](#)]
- Caramanica, Ari, Luis Huaman Mesia, Claudia R. Morales, Gary Huckleberry, Luis Jaime Castillo B., and Jeffrey Quilter. 2020. El Niño Resilience Farming on the North Coast of Peru. *Proceedings of the National Academy of Sciences of the United States of America* 117: 24127–37. [[CrossRef](#)]
- Castillo, Luis Jaime. 2001. The Last of the Mochicas: A View from the Jequetepeque Valley. In *Moche Art and Archaeology in Ancient Peru*. Edited by Joanne Pillsbury. New Haven: Yale University Press, pp. 307–28.
- Castillo, Luis Jaime. 2010. Moche Politics in the Jequetepeque Valley: A Case for Political Opportunism. In *New Perspectives on Moche Political Organization*. Edited by Jeffrey Quilter and Luis Jaime Castillo. Washington: Dumbarton Oaks Research and Collection, pp. 83–109.
- Castillo, Luis Jaime, and Christopher Donnan. 1994. Los Mochica del Norte y Los Mochica del Sur. In *Vicús*. Edited by Krystof Makowski. Lima: Banco de Crédito del Perú, pp. 143–82.
- Castillo, Luis Jaime, and Ulla Holmquist. 2000. Mujeres y Poder en la Sociedad Mochica Tardía. In *El Hechizo de las Imágenes: Estatus Social, Género y Etnicidad en la Historia Peruana*. Edited by Narda Henríquez. Lima: Fondo Editorial de la Pontificia Universidad Católica del Perú, pp. 13–34.
- Castillo, Luis Jaime, and Jeffrey Quilter. 2010. An Overview of Past and Current Theories and Research on Moche Political Organization. In *New Perspectives on Moche Political Organization*. Edited by Jeffrey Quilter and Luis Jaime Castillo. Washington: Dumbarton Oaks Research and Collection, pp. 1–16.
- Chapdelaine, Claude. 2001. The Growing Power of a Moche Urban Class. In *Moche Art and Archaeology in Ancient Peru*. Edited by Joanne Pillsbury. New Haven: Yale University Press, pp. 69–87.
- Chapdelaine, Claude. 2011. Recent Advances in Moche Archaeology. *Journal of Archaeological Research* 19: 191–231. [[CrossRef](#)]
- Chaucat, Claude, and Belkys Gutiérrez. 2006. Excavaciones en el Conjunto Arquitectónico 18 (Plataforma Uhle) durante las temporadas 1999 y 2000. In *Investigaciones en Huaca de la Luna 2000*. Edited by Santiago Uceda, Elias Mujica and Ricardo Morles. Trujillo: UNT-Backus-Fundación, pp. 103–47.
- Clark, Sharri R. 2009. Material Matters: Representation and Materiality of the Harappan Body. *Journal of Archaeological Method and Theory* 16: 231–61. [[CrossRef](#)]
- Cobo, Bernabé. 1979. *History of the Inca Empire*. Translated by Roland Hamilton. Austin: University of Texas Press. First published 1653.



- Cordy-Collins, Alana. 2001. Blood and the Moon Priestesses: Spondylus Shell in Moche Ceremony. In *Ritual Sacrifice in Ancient Peru*. Edited by Elizabeth P. Benson and Anita G. Cook. Austin: University of Texas Press, pp. 35–54.
- DeMarrais, Elizabeth, and John Robb. 2013. Art makes society: An introductory visual essay. *World Art* 3: 3–22. [\[CrossRef\]](#)
- DeMarrais, Elizabeth, Luis Jaime Castillo, and Timothy Earle. 1996. Ideology, Materialization, and Power Strategies. *Current Anthropology* 37: 15–31. [\[CrossRef\]](#)
- Dillehay, Tom D., and Alan L. Kolata. 2004. Long-Term Human Response to Uncertain Environmental Conditions in the Andes. *Proceedings of the National Academy of Sciences of the United States of America* 101: 4325–30. [\[CrossRef\]](#)
- Dolorier Torres, Camilo, and Lyda Casas Salazar. 2012. Ritos, Tránsito a lo Sagrado y Búsqueda de Equilibrio en el Mundo Moche. In *Cosmos Moche*. Colección del Antiguo Perú. Edited by Roberto Ochoa Berreteaga. Lima: Museo Andrés del Castillo, pp. 139–52.
- Donnan, Christopher B. 1978. *Moche Art of Peru: Pre-Columbian Symbolic Communication*. Los Angeles: Museum of Cultural History, University of California.
- Donnan, Christopher B. 1992. *Ceramics of Ancient Peru*. Los Angeles: Fowler Museum of Cultural History, University of California.
- Donnan, Christopher B. 1997. Deer Hunting and Combat: Parallel Activities in the Moche World. In *The Spirit of Ancient Peru: Treasures from the Museo Arqueológico Rafael Larco Herrera*. Edited by Kathleen Berrin. San Francisco: Thames and Hudson, Fine Arts Museums of San Francisco, pp. 51–60.
- Donnan, Christopher B. 2007. *Moche Tombs at Dos Cabezas*. Los Angeles: UCLA, Cotsen Institute of Archaeology.
- Donnan, Christopher B., and Donna McClelland. 1979. *The Burial Theme in Moche Iconography*. Studies in Pre-Columbian Art and Archaeology No. 21. Washington: Dumbarton Oaks Research Library and Collection.
- Donnan, Christopher B., and Donna McClelland. 1999. *Moche Fineline Painting: Its Evolution and Its Artists*. Los Angeles: Fowler Museum of Cultural History, University of California.
- Douglas, Mary. 1966. *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*. New York: Routledge & Kegan Paul.
- Earle, Wendy Rose. 2010. The Iconography of Moche Winged Figures. Unpublished Master's thesis, Department of Anthropology, University of Texas-Austin, Austin, TX, USA.
- Eisenberg, J., and K. H. Redford. 1999. *Mammals of the Neotropics*. Peru: The Central Neotropics-Ecuador, Chicago: University of Chicago Press.
- Forth, Gregory. 2004. *Nage Birds: Classification and Symbolism among an Eastern Indonesian People*. New York: Routledge.
- Forth, Gregory. 2009. Symbolic Birds and Ironic Bats: Varieties of Classification in Nage Folk Ornithology. *Ethnology* 48: 139–59.
- Foucault, Michel. 1966. *The Order of Things: An Archaeology of the Human Sciences*. Paris: Pantheon Books.
- Franco Jordán, Régulo. 2016. Una Revaluación y Aproximaciones a la Interpretación del Calendario Mítico Ceremonial Moche Basado en la Iconografía de los Temas Complejos de la Huaca Cao Viejo, Complejo El Brujo, Costa Norte del Perú. *Arqueología y Sociedad* 31: 93–163.
- Goepfert, Nicolas. 2008. Ofrendas y sacrificio de animals in la cultura Mochica: El ejemplo de la Plataforma Uhle, Complejo Arqueológico Huacas del Sol y de la Luna. In *Arqueología Mochica: Nuevos Enfoques. Actas del Primer Congreso Internacional de Jóvenes Investigadores de la Cultura Mochica, Lima, 4–5 de Agosto de 2004*. Lima: Institut Français d'Études Andes-Fondo Editorial de la Pontificia Universidad Católica del Peru, pp. 231–44.
- Goepfert, Nicolas. 2011. *Frayer la Route d'un Monde Inversé. Sacrifice et Offrandes Animals dans la Culture Mochica (100–800 apr. J.-C.), côte nord du Pérou*. Paris Monographs in American Archaeology 28. Oxford: BAR International Series 2278.
- Goepfert, Nicolas. 2012. New Zooarchaeological and Funerary Perspectives on Mochica Culture (A.D.100-800), Peru. *Journal of Field Archaeology* 37: 102–20. [\[CrossRef\]](#)
- Gölte, Jürgen. 2009. *Moche, Cosmología y Sociedad: Una Interpretación Iconográfica*. Cusco: Instituto de Estudios Peruanos.
- Graham, Gary L. 1983. Changes in Bat Species Diversity along an Elevational Gradient Up the Peruvian Andes. *Journal of Mammalogy* 64: 559–71. [\[CrossRef\]](#)
- Guaman Poma de Ayala, Felipe. 2009. *The First New Chronicle and Good Government: On the History of the World and the Incas Up to 1615*. Translated by Roland Hamilton. Austin: University of Texas Press. First published 1615.
- Haraway, Donna. 2003. *The Companion Species Manifesto: Dogs, People, and Significant Otherness*. Chicago: Prickly Paradigm Press.
- Heithaus, E. Raymond. 1982. Coevolution between Bats and Plants. In *Ecology of Bats*. Edited by Thomas H. Kunz. New York: Plenum Press, pp. 327–67.

- Hocquenghem, Anne-Marie. 1987. *Iconografía Mochica*. Lima: Pontificia Universidad Católica del Perú, Fondo Editorial.
- Hoffmann, F. G., and R. J. Baker. 2003. Comparative Phylogeography of Short-Tailed Bats (*Carollia*: Phyllostomidae). *Molecular Ecology* 12: 3403–14. [\[CrossRef\]](#)
- Janzen, Daniel H., ed. 1983. *Costa Rican Natural History*. Chicago: University of Chicago Press.
- Koons, Michele L. 2015. Moche Sociopolitical Dynamics and the Role of Licapa II, Chicama Valley, Peru. *Latin American Antiquity* 26: 473–92. [\[CrossRef\]](#)
- Koons, Michele L., and Bridget A. Alex. 2014. Revised Moche Chronology Based on Bayesian Models of Reliable. *Radiocarbon Dates*. *Latin American Antiquity* 56: 1039–55.
- La Chioma, Daniela. 2019. Sound and Music in Andean Pre-Columbian Art: Interdisciplinarity, Methodological Aspects and Interpretative Research. Presented at Music Archaeology of Latin America, University of London, London, UK, October 15–17.
- Laird, Tessa. 2018. *Bat*. London: Reaktion Books Limited.
- Lathrap, Donald W. 1977. Our Father the Cayman, Our Mother the Gourd. In *Origins of Agriculture*. Edited by Charles A. Reed. The Hague: Mouton, pp. 713–51.
- McNab, Brian K. 1982. Evolutionary Alternatives in the Physiological Ecology of Bats. In *Ecology of Bats*. Edited by Thomas H. Kunz. New York: Plenum Press, pp. 151–200.
- Meskel, Lynn. 2004. *Object Worlds in Ancient Egypt: Material Biographies Past and Present*. London: Berg.
- Millaire, Jean-Francois. 2010. Primary State Formation in the Virú Valley, North Coast of Peru. *Proceedings of the National Academy of Sciences* 107: 6186–91. [\[CrossRef\]](#) [\[PubMed\]](#)
- Nanoglou, Stratos. 2008. Qualities of Humanness: Material Aspects of Greek Neolithic Anthropomorphic Imagery. *Journal of Material Culture* 13: 311–34. [\[CrossRef\]](#)
- Navarro, Laura, and Joaquín Arroyo-Cabrales. 2013. Bats in Ancient Mesoamerica. In *The Archaeology of Mesoamerican Animals*. Edited by Christopher M. Götz and Kitty F. Emery. Atlanta: Lockwood Press, pp. 583–605.
- Needham, Rodney. 1979. *Symbolic Classification*. Santa Monica: Goodyear Publication Company, Inc.
- Pillsbury, Joanne, ed. 2001. *Moche Art and Archaeology in Ancient Peru*. New York: Yale University Press.
- Quilter, Jeffrey. 1997. The Narrative Approach to Moche Iconography. *Latin American Antiquity* 8: 113–33. [\[CrossRef\]](#)
- Quilter, Jeffrey, and Michele L. Koons. 2012. The Fall of the Moche: A Critique of Claims for South America's First State. *Latin American Antiquity* 23: 127–43. [\[CrossRef\]](#)
- Reichel-Dolmatoff, Gerardo. 1971. *Amazonian Cosmos: The Sexual and Religious Symbolism of the Tukano Indians*. Chicago: University of Chicago Press.
- Rodríguez de la Fuente, Felix. 1978. *Animals of South America*. London: Orbis Publishers.
- Sax, Boria. 2001. *The Mythical Zoo: An Encyclopedia of Animals in World Myth, Legend and Literature*. Santa Barbara: Overlook Books.
- Shimada, Izumi. 1994. *Pampa Grande and the Mochica Culture*. Austin: University of Texas Press.
- Sillar, Bill. 1992. Playing with God: Cultural Perceptions of Children, Play and Miniatures in the Andes. *Archaeological Review of Cambridge* 13: 47–64.
- Sutter, Richard C., and Rosa J. Cortez. 2005. The Nature of Moche Human Sacrifice: A Bio-Archaeological Perspective. *Current Anthropology* 46: 521–49. [\[CrossRef\]](#)
- Swenson, Edward. 2006. Competitive Feasting, Religious Pluralism and Decentralized Power in the Late Moche Period. In *Andean Archaeology III. North and South*. Edited by W. Isbell and H. Silverman. New York: Springer, pp. 112–42.
- Swenson, Edward. 2007. Adaptive Strategies or Ideological Innovations? Interpreting Sociopolitical Developments in the Jequetepeque Valley of Peru during the Late Moche Period. *Journal of Anthropological Archaeology* 26: 253–82. [\[CrossRef\]](#)
- Swenson, Edward. 2008. San Ildefonso and the “Popularization” of Moche Ideology in the Jequetepeque Valley. In *Arqueología mochica: Nuevos Enfoques*. Edited by L. J. Castillo Butters, Helen Bernier, Gregory Lockard and Julio Rucabado Yong. Lima: Fondo Editorial Pontificia Universidad Católica del Perú, pp. 411–31.
- Swenson, Edward. 2012. Warfare, Gender and Sacrifice in Jequetepeque, Peru. *Latin American Antiquity* 23: 167–93. [\[CrossRef\]](#)
- Swenson, Edward. 2018. Sacrificial Landscapes and the Anatomy of Moche Biopolitics: (AD200–800). In *Powerful Places in the Ancient Andes*. Edited by Justin Jennings and Edward Swenson. Albuquerque: University of New Mexico Press, pp. 247–86.
- Tello, Julio C. 1909. *La Antigüedad de la Sífilis en el Perú*. Lima: Sanmartín y CA.

- Trever, Lisa S. 2013. Moche Mural Painting at Pañamarca: A Study of Image Making and Experience in Ancient Peru. Unpublished Ph.D. dissertation, Department of Anthropology, Harvard University, Cambridge, UK.
- Trever, Lisa S. 2017. *The Archaeology of Mural Painting at Pañamarca, Peru*. Washington: Dumbarton Oaks Research Library and Collection.
- Trever, Lisa S. 2019. A Moche Riddle in Clay: Object Knowledge and Art Work in Ancient Peru. *The Art Bulletin* 101: 18–38. [\[CrossRef\]](#)
- Trever, Lisa, A. Stack, Carrie Brezine, Tom Cummins, N. Elphick, A. Hamilton, Michelle Koons, Jeffry Quilter, Gary Urton, and Nathaniel Vanvalkenburgh. 2009. *Materiality, Ontology and the Andes. The Vanderbilt-Chicago-Harvard Workshop for Andean Anthropology 2009*. Nashville: Department of Anthropology, Vanderbilt University.
- Tufinio, Moisés. 2006. Excavaciones en el Frontis Norte y Plaza 1 de Huaca de la Luna. In *Proyecto Arqueológico del Huaca de la Luna. Technical Report 2005*. Edited by Santiago Uceda and Ricardo Morales. Trujillo: Universidad Nacional de Trujillo, pp. 41–77.
- Tuttle, Merlin D. 1970. Distribution and Zoogeography of Peruvian Bats, with Comments on Natural History. *The University of Kansas Science Bulletin* 49: 45–86. [\[CrossRef\]](#)
- Tuttle, Merlin D. 1984. Harmless, Highly Beneficial Bats Still Get a Bum Rap. *Smithsonian* 14: 74–81.
- Uceda, Santiago. 2010. Theocracy and Secularism: Relationships between the Tempe and Urban Nucleus and Political Change at the Huacas de Moche. In *New Perspectives on Moche Political Organization*. Edited by Jeffrey Quilter and Luis Jaime Castillo. Washington: Dumbarton Oaks Research Library and Collection, pp. 132–58.
- Uceda, Santiago, Ricardo Morales, and Elías Mujica. 2016. *Huaca de la Luna. Templos y dioses Moche*. Lima: Fundación Backus & World Monument Fund.
- Valdizan, Hermilio. 1915. *La Alienación Mental entre Los Primitivos Peruanos*. Lima: Universidad Nacional Mayor de San Marcos.
- Vaughn, Terry A. 1966. Morphology and Flight Characteristics of Molossid Bats. *Journal of Mammology* 47: 249–60. [\[CrossRef\]](#)
- Velazco, Paúl M., and Kerry A. Kline. 2019. *Tomopeas ravus* (Chiroptera: Molossidae). *Mammalian Species* 51: 70–74. [\[CrossRef\]](#)
- Villa-R., Bernardo. 1966. *Los Murciélagos de México*. Mexico City: Universidad Nacional Autónoma de México.
- Viveiros de Castro, Eduardo B. 1998. Cosmological Deixis and Amerindian Perspectivism. *The Journal of the Royal Anthropological Institute* 4: 469–88. [\[CrossRef\]](#)
- Viveiros de Castro, Eduardo B. 2004. Exchanging Perspectives: The Transformation of Objects into Subjects in Amerindian Ontologies. *Common Knowledge* 10: 463–84. [\[CrossRef\]](#)
- Weismantel, Mary. 2018. Cuni Raya Superhero: Ontologies of Water on Peru's North Coast. In *Powerful Places in the Andes*. Edited by Justin Jennings and Edward Swenson. Albuquerque: University of New Mexico, pp. 175–208.
- Weismantel, Mary, and Lynn Meskell. 2014. Substances: 'Following the Material' through Two Prehistoric Cases. *Journal of Material Culture* 19: 233–51. [\[CrossRef\]](#)
- Wilbert, Johannes. 1974. *Yupa Folktales*. Los Angeles: UCLA Latin American Center Publications.
- Włoszyn, J. Z., and K. Piwowski. 2015. Sodomites, Siamese Twins, and Scholars: Same-Sex Relationships in Moche Art. *American Anthropologist* 117: 285–301. [\[CrossRef\]](#)
- Zamora, Hugo, Cesar Medina, Alain Escobar, Yamileth Arteaga, Richard Cadenillas, and Paúl M. Velazco. 2014. New Distributional Record of the Rare Endemic Peruvian *Tomopeas ravus* Miller, 1900 (Chiroptera, Molossidae, Tomopeatinae). *De Gruyter* 78: 257–60.
- Zedeño, María Nieves. 2009. Animating by Association: Index Objects and Relational Taxonomies. *Cambridge Archaeological Journal* 19: 407–17. [\[CrossRef\]](#)

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