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Recent Advances in Moche Archaeology

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Abstract The discovery of the royal tombs at Sipán in 1987 propelled Moche archaeology to the forefront of Andean studies. In the last decade, the study of Moche political organization and ideology through public architecture, cultural remains, funerary patterns, and iconography has forced the revision of previous conceptions about Moche state formation, urbanism, and the functioning of this complex society. Major advances in iconography, internal organization of urban centers, temples and domestic architecture, craft production, and mortuary patterns are embedded in a new chronology that supports a longer development and a more gradual collapse. The recognition of Moche as the first state in South America is still valid, but its monolithic character is rejected in favor of several autonomous polities. The number and size of potential Moche states are currently debated, as is the role of warfare and ideology in Moche state formation.

Keywords Moche · Chronology · Urbanism and state formation · Iconography · Collapse

Introduction

Over the past two decades, Moche civilization has attracted worldwide attention as a result of spectacular discoveries that include the royal tombs at Sipán, San José de Moro, Dos Cabezas, and, more recently, at Ucupe in the Zaña Valley. Emerging from the arid sand plains that border rivers flowing from the Andes, Moche civilization relied on irrigation to support a stratified society and the growing needs of its elite. Such control of water, which was seen as a gift from the gods, involved

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making use of available technology to build an efficient network of canals that increased agricultural productivity and held back the desert sands, especially in the lower valleys of the Peruvian north coast. Each river, surrounded by a small ribbon of fertile land, played a role similar to that of the Nile. Moche political economy was centered on large civic-ceremonial centers whose urban class produced a range of goods. These city dwellers were linked symbiotically to many smaller agrarian villages scattered throughout the land. Although water was the most critical resource, other challenges included drought and severe El Niño rainfall, as well as demographic pressure on cultivated lands. An impressive diversity of plants allowed peasants to be productive, although destructive floods provoked by El Niño were potentially disastrous to the population and the entire system's stability. As a way of forestalling social upheavals and maintaining control over commoners, rulers could redistribute their accumulated surplus to those sectors of society. Prestigious goods made at the large urban centers also were distributed to various segments of the population, including rural leaders, as a way to foster a sense of identity and legitimize the ruling class within the Moche's centralized power structure (Alva and Donnan 1993; Demarrais et al. 1996; Moseley 1992; Wilson 1999).

Following its discovery at the turn of the 19th century, Moche civilization soon became known for its impressive ceramics and other media. The Moche (or Mochica) culture was first recognized by Max Uhle when he visited the ruins of Moche, made some sketches, and collected ceramics. Uhle proposed that the culture predated the Chimu. The most prominent scholar in the first half of the 20th century was Larco Hoyle, who amassed a considerable collection of Moche ceramics from several north coast valleys. Considered the father of Moche archaeology, he published a number of articles (Larco Hoyle 2001), organized a meeting in 1946 of scholars interested in the Moche (Castillo 2001b), and proposed the first relative chronology based on Moche ceramics, most of which had been obtained through looting.

Only recently has Moche field- and laboratory-based archaeology attained the methodological efficiency and breadth expected of modern archaeological programs. Several important discoveries have marked the study of the Moche, including the grave of the Warrior Priest in the Virú Valley in 1946 (Strong and Evans 1952) and the Pañamarca murals (Bonavia 1985; Schaedel 1951). However, a true watershed of increased fascination with the Moche occurred in 1987 with the discovery of the royal tombs of Sipán (W. Alva 1988, 1994, 2001, 2008; Alva and Donnan 1993). Beginning in the 1990s, long-term research investigations have been instrumental in generating new data. One significant development in Moche archaeology has been the restoration of monumental buildings such as Huaca de la Luna and Huaca Cao Viejo. At these monumental sites, polychrome murals made of plastered clay cover walls of large interior patios as well as exterior walls in front of huge plazas. Depicting a range of figures and themes—warriors, priests, prisoners, supernatural beings, and the Moche god known as the decapitator—the murals provide invaluable information on Moche's complex political and military system, as well as their religion. Interpretation of these images, whose discovery continues at a steady pace, relies in part on comparisons with motifs found on ceramics and textiles. Also associated with these impressive decorated buildings are burials and a

range of exquisite ceramics and prestige goods made of metal, shell, wood, and stone.

One reason for the considerable interest in the Moche civilization is the work of its artisans, who worked and transformed a wide range of materials with great ingenuity and skill. Yet even though the last decade has witnessed an increase in the number of Moche scholars, work on the Moche has yet to match the enduring enthusiasm and dynamism of Maya archaeology (see Marcus 2003 for a comparison). Most yearly meetings of the Society for American Archaeology typically host no more than two symposia dedicated to the Moche as opposed to 20 or more on Maya archaeology. Still, one cannot deny the significant recent advances made by Moche archaeology as it continues to move beyond the interpretive and methodological limitations of the pre-1980 period. This scholarly maturity is illustrated by increasing numbers of academic fora, workshops, collaborative field projects (including multidisciplinary efforts), shared databases, and publications (including syntheses), and greater reliance on new technology (Bourget and Jones 2008; Castillo et al. 2008; Pillsbury 2001; Quilter and Castillo 2010a; Uceda and Mujica 1994, 2003a). Significantly, Peruvian archaeologists themselves played a central role in the growth of the discipline and the dissemination of information.

No single theoretical paradigm has yet been agreed upon as an approach to understand how the Moche developed and functioned. The Moche traditionally have been viewed as a single, united polity that attained state-level status, either in the 5th century AD during Phase IV or later in the 7th century AD during Phase V (Moseley 1992; Shimada 1994a). More recently, following consensus among most scholars (Castillo and Uceda 2008), the Moche polity has been divided into northern and southern cultural spheres (Castillo and Donnan 1994a), with the Paijan Desert separating the two (Fig. 1). This division appears to have occurred during Phase III or the Middle Moche period (probably between AD 300 and 400, see Chronology section below). The trend among some Moche scholars toward recognizing diversity in political organization also has led to suggestions of political autonomy and economic autarchy within individual northern valleys, views that have themselves promoted a return to the debate regarding the minimum size of an Andean state (Wilson 1988). Was the Moche civilization a collection of single valley states or a single state consisting of multiple valleys? This question makes it all the more difficult to identify the Moche as the first true state on the north coast of Peru and to determine when it did, in fact, attain state-level organization. Debate on this issue revolves on the key variable of the extent and nature of power centralization.

A more detailed history of research on the Moche is available elsewhere (Bawden 1996; Castillo and Uceda 2008; Shimada 1994a; Uceda and Mujica 1994, 1998). Even as the ideas and information generated by recent meetings, exchanges, and publications have sharpened our knowledge of Moche culture and civilization, they also have shaken the foundations of earlier thinking on the Moche, especially concerning chronology, cultural homogeneity, sociopolitical organization, and ideology (Bawden 1994, 1995, 2001, 2004; Donnan 1978; Moseley 1992; Shimada 1994b; Wilson 1988).

Our understanding of the Moche is increasingly grounded in archaeological fieldwork. Moche archaeology owes much of its increased visibility and appeal to a

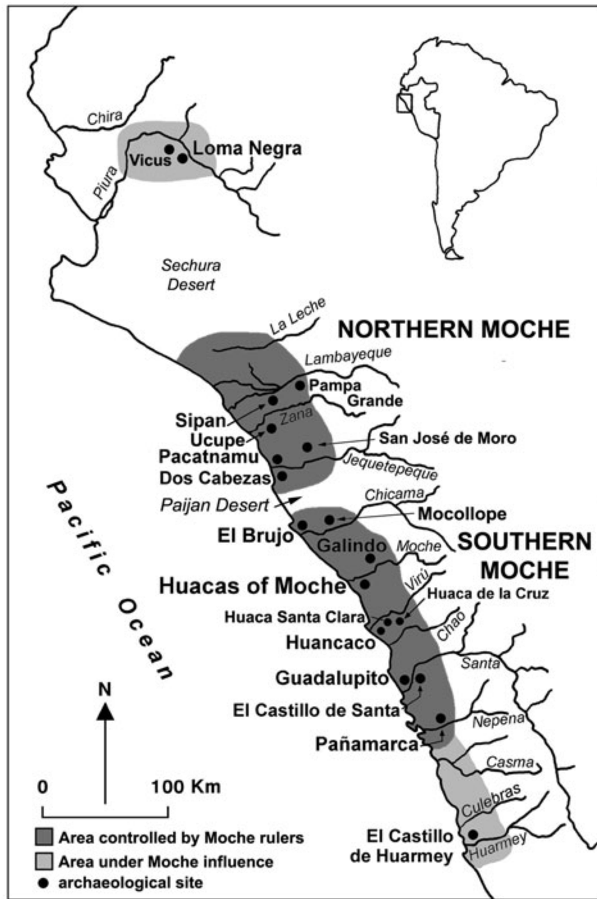

Fig. 1 Major Moche sites and geographic division into northern and southern spheres

number of long-term national and international projects, five of which deserve greater mention: Sipán (Alva 2001; Alva and Donnan 1993), Huaca de la Luna (Uceda and Mujica 1994, 2003a), El Brujo (Franco et al. 1994, 2003), San José de Moro (Castillo 2003; Castillo and Donnan 1994b; Donnan and Castillo 1994), and the Pacatnamu/Dos Cabezas projects (Donnan 2001a, 2003, 2007; Donnan and Cock 1986, 1997; Ubbelohde-Doering 1983). The results of these long-term projects, as well as others focusing on several major sites or valleys, are giving Moche archaeologists food for thought and compelling them to reassess their views on the socioeconomic dimensions of each center, as well as the nature of relations that linked them to one another. The growing set of data is making it increasingly difficult to support the scenario of a single Moche territorial state; on-going excavations at many regional centers are forcing reevaluations of their status within the Moche sphere and challenging the traditional model of Huacas of Moche's hegemonic control of neighboring valley polities. A deeper understanding of Moche necessitates a close look at the thorny issue of chronology.

Chronology

Our understanding of Moche chronology has evolved dramatically over the last decade. Moche civilization is a long cultural phenomenon that probably lasted eight centuries. Its beginnings are not well established through relative and radiometric dating, mostly because layers pertaining to these earlier times are buried under meters of refuse. Nevertheless, the accumulation of radiocarbon dates at major sites in different valleys in association with ceramic vessels that could be attributed to specific stylistic phases is contributing to a new chronology where style, space, and time are sending complex signals. Additional dates and more controlled excavations of good contexts such as tombs are badly needed, but the new data are sufficient to provide a refreshing look at Moche chronology.

One major difficulty is comparing data from each valley within a revised framework that considers the calibrated dates and their associated ceramic style. Moche archaeologists are wondering whether they should get rid of the old Larco ceramic sequence, first published in 1948 (Larco Hoyle 2001), or breathe new life into it (Castillo 2003; Donnan and McClelland 1999). The ceramic sequence remains the most basic approach to Moche chronology, but radiocarbon dates also must be viewed as instrumental to the cultural framework. Ceramic seriation at the valley level is one solution (Castillo 2000, 2003), but intervalley comparison and unity in ceramic descriptions also are needed.

The division of the Moche into northern and southern spheres implies differences in their ceramic typologies. The Larco ceramic sequence was constructed using vessels from the southern sphere, where most of the portrait vessels, stirrup-spout vessels, and flaring bowls were produced. This five-phase chronology has long been used to order sites and funerary contents chronologically. The absence or scarcity of these vessel types in the northern valleys rendered the use of Larco ceramic sequence inadequate, and local sequences were developed to translate new data more accurately. While the Larco ceramic sequence is still relevant in southern valleys (Castillo and Uceda 2008; Chapdelaine 2008; Donnan 2007), a new sequence has been built for the Jequetepeque Valley, where the five phases of the southern Moche are replaced by an Early, Middle, and Late Moche sequence followed by a Transitional period (Castillo 2000, 2003). A detailed ceramic sequence for the Lambayeque region (Leche, Reque, and Zaña Valleys) is not available, and it is assumed that the Jequetepeque sequence is representative of the northern valleys. The Piura Valley is excluded from the discussion here, and the possibility of a distinctive ceramic sequence must be taken into account (Kaulicke 1994; Makowski et al. 1994).

A major problem arises when we try to establish equivalences between the Larco and northern sequences. If the classification of ceramics from the early Phases I and II is less difficult because of their scarcity in the archaeological database, the same cannot be said for the later phases. The Middle Moche phase of the Jequetepeque Valley corresponds to Moche Phase III and only a part of Phase IV of the southern valleys. This important difference results from a lengthier Phase IV in southern Moche. While Phases III and IV may coincide chronologically with Middle Moche, the ceramics are not similar. Northern Moche ceramics reflect a strong regional

DATE AD calibrated*	Chronological Period	Northern Moche	Southern Moche
		LAMBAYEQUE & JEQUETEPEQUE Valleys	CHICAMA, MOCHE, & SANTA Valleys
1000	Late Intermediate	Sican	Chimu
800	Middle Horizon	Transitional	Pre-Chimu/Casma
700		Late Moche C Late Moche B	Moche Phase V
600		Late Moche A	Moche Phase IV
500	Early Intermediate		
400		Middle Moche	Moche Phase III
300			
200		Early Moche	Moche Phase II
100			Moche Phase I

Fig. 2 Relative chronology for Moche archaeology

identity that has few of the hallmarks of southern Moche Phase IV. The Late Moche in the Jequetepeque Valley is the equivalent of Phase V, but chronologically it is contemporaneous with the late southern Moche Phase IV and Phase V (Fig. 2).

The different ceramic sequences for the northern and southern spheres are not yet well compared, and working within this new paradigm may produce confusion as long as the equivalence between them has not been studied carefully. The oversimplified correspondence presented in Fig. 2 masks enormous discrepancies between contemporaneous northern and southern ceramic assemblages. Any change in Larco's seriation or in the northern sequence will have an impact on the relation between the two ceramic sequences. The acceptance of two Moche geographic entities makes it clear that there is no longer a single stylistic seriation for all Moche ceramics. The Moche can no longer be viewed as a unified culture but should instead be seen as a multitude of cultural entities that shared basic cultural elements developed through a similar coastal adaptation (Bawden 1996). Particular views or perspectives could be valid only at the valley scale, as seems to be the case for the Jequetepeque Valley.

The old system of horizons and periods is inappropriate since it was conceived to order polities as monolithic entities in distinct time periods (Chapdelaine 2010b). It is now evident that some polities encompass the timeline dividing the Early Intermediate period (EIP) and the Middle Horizon (MH). It was believed that the Moche constituted a dominant culture on the north coast in the EIP and that their decline occurred during the MH. This scenario is now considered incorrect. Instead, the Moche attained their climax in the first half of the MH as two distinct spheres,

both struggling through ecological catastrophes and surviving a longer period than previously thought (Uceda et al. 2008).

The revised chronology has major consequences for our understanding of Moche civilization and its developmental stages (Castillo and Uceda 2008; Chapdelaine 2000, 2001, 2002, 2003; Lockard 2009; Uceda et al. 2008). First, the origin of the Moche as a distinctive culture remains ambiguous. The time allotted to the first two phases in the south and for Early Moche in the northern sphere remains speculative. By general consensus, a range between AD 100 and 300 is given for these two phases, but in truth data are lacking. In a major contribution, several tombs at Dos Cabezas were radiocarbon dated to the Middle Moche period while their funerary ceramics belong stylistically to Phase I or II of the Larco ceramic sequence (Donnan 2007). One conclusion is that ceramics of the Early Moche period were still popular among the higher elite during Middle Moche, at least in the Jequetepeque Valley or at Dos Cabezas.

Second, radiocarbon dates from Huacas of Moche and from El Castillo in the lower Santa Valley confirm the ceramic sequence established by Larco, specifically Phases III and IV. Phase III ceramic style started around AD 250–300 and lasted into the 5th century AD, making it coeval with Phase IV, although mixed assemblages are rather rare in tombs. It is thus possible that stylistic change occurred rapidly between AD 400 and 500, but the tempo is unknown and may have been different in each southern valley. For the northern valleys, the stylistic dissociation started during Phase III and Middle Moche; although the ceramics present some resemblances at the beginning, they are clearly distinctive at the end of the southern Phase III.

Third, radiocarbon dates from the capital site of Huacas of Moche and various sites in the lower Santa Valley indicate that the Phase IV ceramic style lasted much longer than the commonly accepted date of AD 600. Radiocarbon dates and architectural context suggest that the style lasted until the 8th century AD.

Fourth, the new dates confirm that Huacas of Moche was inhabited during the first half of the MH and that the Phase IV ceramic style was still the only dominant style, with the elite refusing to adopt the new Phase V ceramic style. The same conclusion could be arrived at for sites in the Santa Valley (Chapdelaine 2008) and at El Brujo, where no tomb with Phase V ceramic style has yet been found on Huaca Cao Viejo (Mujica 2007). The dating of El Brujo is supported by few radiocarbon dates (Franco et al. 2003, 2004), but they show a range similar to that obtained at Huacas of Moche.

Fifth, the rapid collapse of Huacas of Moche and its associated Phase IV ceramic style, as proposed in previous syntheses (Bawden 1996; Moseley 1992; Shimada 1994a; Wilson 1999), is no longer viable. Burials located near the surface (Tello et al. 2003) and radiocarbon dates for hearths at intervals between AD 600 and 800 confirm the vitality of the urban class (Chapdelaine 2002, 2004b) and show that the inhabitants did not rapidly abandon the site around AD 600. They survived the ecological catastrophes of the second half of the 6th century AD (Moseley 1987, 1997; Shimada et al. 1991), and the decline of Huacas of Moche was in fact gradual (Chapdelaine 2000). The collapse of the Moche IV polity located at Huacas of Moche probably occurred at the end of the 8th century AD, but the abandonment of the settlement may have been more gradual in the first decades of the 9th century AD.

Sixth, the elite and the urban class at Huacas of Moche never exchanged their Phase IV ceramic style for the Phase V style. With the identification of a new center at Galindo bearing clear evidence of Phase V ceramic style, it is now obvious that Phase IV at Huacas of Moche and Phase V at Galindo (Bawden 1982; Lockard 2008, 2009) were contemporaneous for at least a century. The range in calibrated dates—between AD 450 and 800 for Huacas of Moche (Chapdelaine 2002, 2003; Uceda et al. 2008) and AD 550 and 875 for Galindo (Lockard 2008, 2009)—indicates that Galindo was later in time but still developing at the same time that Huacas of Moche was gradually declining.

In sum, the new dates make it appropriate to consider late northern Moche polities and the southern Moche state with its Phase IV ceramic style as contemporaneous. They were certainly interacting between AD 600 and 800. The considerable overlap between northern and southern Moche makes us reconsider the nature of the relationship between these polities and the problematic use of the related ceramic sequences.

Urbanism: Public and domestic architecture

Most fieldwork in the last ten years has been devoted to the study of monumental buildings and elite residences. Long-term projects have focused on major centers such as Sipán, San José de Moro, Pacatnamu, Dos Cabezas, El Brujo, and Huacas of Moche. Investigations are ongoing at other prominent Moche centers: Huaca El Pueblo, a monumental site dominated by Huaca Quiñones in the Zaña Valley (Bourget 2008b); Galindo in the Moche Valley (Lockard 2005, 2008, 2009); Huancaco in the Virú Valley (Bourget 2003, 2004, 2010); and El Castillo and Guadalupito in the lower Santa Valley (Chapdelaine 2008, 2010a; Chapdelaine and Pimentel 2003; Chapdelaine et al. 2004). Secondary sites that have been investigated include San Ildefonso (Swenson 2006, 2007, 2008), Portachuelo de Charcape (Johnson 2008), and Cerro Chepén (Rosas 2007) in the Jequetepeque Valley; Mocollope and Cerro Mayal (Russell and Jackson 2001; Russell et al. 1994, 1998) in the Chicama Valley; Ciudad de Dios and other sites of the middle Moche Valley (Billman 2010; Billman et al. 1999; Gagnon 2008; Gumerman and Briceño 2003; Ringberg 2008); and Santa Clara (Millaire 2004b, 2010) in the Virú Valley. Surveys in valleys such as Zaña (Dillehay 2001), Jequetepeque (Dillehay et al. 2009), Chicama (Galvez and Briceño 2001), Moche (Billman 1996, 1999), Virú (Willey 1953), Chao (Carcelen and Angulo 1999; Pimentel and Paredes 2003), Santa (Donnan 1973; Uceda 1988; Uceda et al. 1990; Wilson 1988), Nepeña (Proulx 1968, 1973, 2004), Casma (Pozorski and Pozorski 1998; Wilson 1995), Culebras (Przadka and Giersz 2003), and Huarmey (Bonavia 1982; Prümers 1989, 2000) are producing data relevant to the study of Moche urbanism.

Public architecture

The Moche landscape is dominated by large platforms and their associated plazas (Gamboa 2005). They were made with thousands of adobes, rising tens of meters

above the valley floor. The summit was accessible by a set of frontal and lateral ramps. The flat top was often laid out with large patios, rooms, and corridors; the highest bench in one room was probably the seat of the supreme ruler. Differences have been noted between huacas of the northern and southern Moche spheres (Bawden 1996, pp. 134–136), and a greater understanding of these major architectural features is instrumental in supporting the division of the Moche realm. The Moche landscape also includes long canals and sometimes aqueducts near major settlements. Their construction and maintenance were essential to the growth and power of the Moche ruling class.

Almost every important Moche center is characterized by the construction of two platforms, or huacas (Quilter 2002). In general, one is bigger and higher than the other. The huacas are central elements of Moche urbanism. Usually, the space between them is filled with residential compounds and cemeteries. Before extensive fieldwork took place in these open areas, the presence of scattered adobes and broken ceramic vessels on the surface were seen as indicators of a living population associated with religious buildings, forming a typical ceremonial center. Extensive excavations in these residential quarters, however, revealed craft production as a major function, in addition to storage facilities at the compound level (Chapdelaine 2002, 2009). Huacas of Moche is now considered to be much more than a ceremonial center (see Quilter 2002 for the old vision), and its unique urbanism with streets, residential blocks or compounds, workshops, and plazas makes it a true city (Canziani 2003; Chapdelaine 2003). The urbanism of Huacas of Moche is similar to that of Pampa Grande—the late Moche Phase V site that was considered a formal city based on the presence of compounds, craft production, and storage facilities (Shimada 1994a)—and Galindo (Bawden 1982; Lockard 2009). The urban development at Huacas of Moche is much earlier, however, probably starting late in Moche Phase III. A Peruvian team verified the antiquity of one major street at the center of the urban zone. The street layout descends several meters without being truncated by old residential buildings (Uceda and Mujica 2006). Although some streets may have had a longer use, this could not be verified everywhere since the residential blocks were reconstructed at a steady rate. Nevertheless, a unique urbanism with a distinctive layout arose early at Huacas of Moche, and the urban layout encountered near the actual surface is representative of what occurred early in the sequence. Huacas of Moche and its city dwellers were innovators in building the first capital of a unique state that grew to satisfy the needs of powerful elite.

Large-scale and long-term research projects are still underway on Huaca Cao Viejo and Huaca de la Luna. Information from the excavations in these public buildings is overwhelming in its volume and richness. The most basic conclusion is that each building was covered several times by the construction of a new monument on top of the old one. The rebuilding process, reminiscent of Maya pyramids, has been documented at least five times at these two sites (Franco et al. 2003; Mujica 2007; Uceda and Canziani 1998; Uceda and Tufinio 2003). These major changes are probably linked to religious or astronomical cycles or to a new leader's need to legitimize his power (DeMarrais et al. 1996; Uceda 2000). The energy invested in these rebuilding programs is hard to evaluate, but the taller the building, the higher the cost and the farther the distance between the elite and their supporters.

But what have we learned about the function of these public buildings? They have always been considered temples, and as such they are generally presented as religious buildings (Donnan 2010; Quilter 2001; Uceda 2001). This point of view prompts Uceda (2008b) to propose that the Moche developed a theocratic state. In a previous work (Uceda and Tufinio 2003, p. 224), the main conclusions about Huaca de la Luna were threefold: this type of monumental architecture was the product of a complex socioeconomic structure; this specific Moche temple was used for various ritual and ceremonial activities tending toward power legitimization and renewal; and propitiatory actions and human sacrifices were the dominant activities carried out in various rooms of this complex.

The Huaca de la Luna temple is thus a good illustration of the power that rested in the hands of religious rulers. It is hard to distinguish the religious nature of this type of public building from its political utility. The Huaca de la Luna has a unique entrance from a monumental ramp that could be reached only after crossing a huge plaza—delimited on its northern and western sides by impressive walls—through a single and narrow entrance at the north end of the complex. Thus it is evident that Huaca de la Luna was an architectural complex with controlled access. The plaza could have easily accommodated hundreds of people, maybe a few thousand, but the platform was never designed for a large public gathering. Only privileged people had access to the upper platform, and human sacrifice was carried out in two different areas of the huaca (Bourget 1997, 1998, 2001a, b, 2005, 2006; Bourget and Newman 1998; Tufinio 2008; Verano 1998, 2001a, b, 2008). Ritualized violence was part of various ceremonies carried out in these precincts, away from the commoners.

Our knowledge of Moche platforms is limited to a single huaca at El Brujo and Huacas of Moche, with no recent investigation at Huaca Cortada or at Huaca del Sol. We thus have a very incomplete picture of the role and function of these monumental buildings (Franco et al. 2010). At Huacas of Moche, the Huaca de la Luna was considered a temple very early in its investigation (Uceda and Paredes 1994); after almost 20 years of excavation, the same general function is still valid (Uceda 2008b, 2010). In fact, interpreting Huaca de la Luna within the universal framework of opposing palace to temple (see Manzanilla 1987 for an Old World case), Uceda argues that Huaca del Sol might have been the palace or the building where the administration of state affairs was carried out. Unfortunately, the summit is badly destroyed and no evidence of a palatial residence has ever been detected. A different perspective did not produce conclusive evidence for considering Huaca de la Luna as a special type of palace (Chapdelaine 2006), but the whole architectural layout is much more complex than just a temple. Moche rulers may indeed have inhabited Huaca de la Luna, or the Uhle Platform located at its foot. They may have carried out various state activities, including accumulating wealth in large storage areas in the northwestern corner of the huaca (Uceda, personal communication 2008).

Although the Moche palace at Huacas of Moche is an unsolved issue, I am convinced that Moche rulers had palaces just as other civilizations did (see Flannery 1998). Uceda (2008b) unequivocally supports the identification of a palace at the controversial site of Huancaco (Bourget 2003). If Uceda and Bourget are right, the

monumental building identified as a palace is significantly larger than the temple. Huancaco offers a distinctive view of what could be a palace, but the architecture is not at all similar to that of Huaca del Sol. Variability of palaces should be expected, and some architectural elements at Huancaco were more in line with those at Huaca de la Luna. These buildings likely had mixed religious and administrative functions in that state activities could be carried out at both types of monumental architecture. Investigations at the second huaca in major Moche centers will certainly contribute immensely to this debate.

Domestic architecture

Moche habitation sites have been identified in each valley. Most are located above irrigation canals overlooking cultivated lands. Houses are made of adobes, but stone is often used for buildings erected high on the slopes of hills. The use of adobes might then be a variable for looking at hierarchy within settlement communities. The study of hinterland communities away from the big centers is progressing at a slow rate, and the upcoming publication of various excavations in the middle Moche Valley and elsewhere will make a great contribution.

Knowledge of domestic architecture comes mostly from projects located at larger Moche centers. The building material is adobe and well standardized; hierarchy is visible by looking at the size and quality of construction as well as the quantity of nonutilitarian goods (Chapdelaine 2002, 2003, 2006, 2009; Pozorski and Pozorski 2003; Van Gijseghem 2001). The size of some compounds, especially at Huacas of Moche, makes it difficult to expose their entire construction through horizontal digging (Chapdelaine 1997, 2001; Uceda and Chapdelaine 1998). A rectangular layout comprising various types of rooms was occupied by several families conducting multiple activities. These compounds were used not only as residences but as workshops; several rooms were used for storage. Moche household archaeology is developing at a steady pace (see Nash 2009 for a comprehensive overview of household studies at the Andean level), and much more information is expected from projects underway. As was proposed by Nash (2009), a synthetic presentation of comparisons drawn between urban and rural households is eagerly awaited.

Sociopolitical organization and state formation

Very early, the Moche culture was awarded a special place among South American civilizations, mostly on the basis of its artistic achievements. Yet despite the monumentality of its public architecture, its recognition as an early state was neither easy nor convincing. Even today, scholars using a particular set of variables might disqualify the Moche as a pristine state of the New World. The new urban features revealed over the last 15 years and increased awareness of Moche craft production, specialization, and hierarchy are lending more credit to the thesis that at least one polity centered at Huacas of Moche attained state level complexity (Chapdelaine 2009). It is not enough, however, to consider the Moche civilization as a state; it is more important to understand its functioning and its nature.

The evolutionary typology consisting of chiefdoms and states is considered by some researchers as outmoded (see Bawden 2004, 2008; Castillo and Uceda 2008). While acknowledging the difficulty of defining a state, or even an Andean state, for ease of presentation, I follow here the conventional framework.

Castillo and Uceda (2008) have recently proposed a geographic division of the Moche realm into four entities: Mochica of Piura, of Lambayeque, of Jequetepeque, and southern Moche. The latter is the equivalent of the southern Moche sphere discussed previously; the first three pertain to the northern Moche sphere. Castillo also proposes that the Jequetepeque Valley may have been the theater of four competing polities during Late Moche, each one designed as an opportunistic state (Castillo 2010). This suggestion is probably in reaction to the difficulty of imagining a political devolution when a stratified society is fragmented into smaller units that are more similar to complex chiefdoms or city-states. Of concern here is the possibility that several Moche states developed along different pathways in several valleys, each with specific characteristics that were not present in the others. Supporting evidence for this type of fragmented political organization is the impressive wealth of leaders' royal tombs in different valleys, implying a complex social organization and the subsequent incapacity to establish a hierarchy among the major centers. These developments and possible interactions between the polities are not associated with clear evidence of warfare or the existence of standing armies. The nondefensive position of the major Moche centers confirms ritual battles, illustrating a kind of "Pax Mochica" (Wilson 1988).

The relabeling of Moche sociopolitical organization is reaching a crescendo, underscoring the absence of a consensual definition of an Andean state. It is difficult to rely on old definitions and variables developed for Old World civilizations. Recent data on urbanism, social hierarchy drawn from elite tombs and residences, ideology, technology, craft production, standardization, and trade are giving shape to a vibrant society with at least three social classes. The commoners (peasants, herders, construction workers) occupied the bottom sociopolitical rung. Artisans, bureaucrats, and warriors form a newly identified middle class. The upper echelon was occupied by an elite that, as proposed by Castillo (2008), may be divided into three subgroups: lower (provincial leaders), upper (high priests and priestess), and royalty (the king). The Moche social pyramid is thus well stratified (Fig. 3). There is no doubt that social movement was possible between the two lower classes; the elite classes also may have allowed some vertical movement among them.

The study of funerary practices to understand social complexity and the rise of paramount leaders has played a dynamic role in Moche studies over the last decade (Alva and Donnan 1993; Castillo and Donnan 1994b; Donnan 1995, 2007; Millaire 2002; Tello et al. 2003). Moche burial traditions are not homogeneous, but several features are shared by the middle and upper classes, including the manipulation of human remains in grave reopening and secondary offerings of human bones (Millaire 2004a).

The northern Moche sphere was especially active in producing wealthy tombs, including royal tombs at Sipán and Dos Cabezas and elite tombs at San José de Moro, Ucupe, and La Mina (Narvaez 1994). Inaugurated in 2004, a long-term project directed by Bourget (2008b), in collaboration with Walter Alva, is

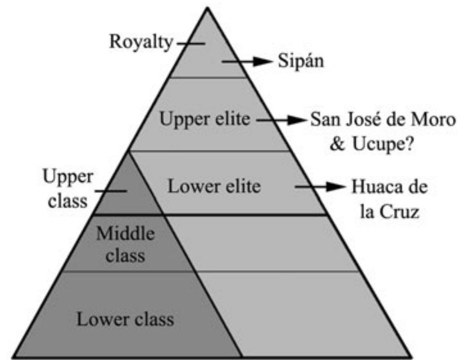

Fig. 3 Moche social pyramid (adapted from Castillo 2008a and Chapdelaine 2004b, p. 178)

investigating the emergence of a Moche polity centered at Huaca El Pueblo, a monumental site dominated by Huaca Quiñones in the modern village of Ucupe. The discovery of the tomb of Lord Ucupe in 2008 has attracted much attention since the site is one of the few known grave sites whose tomb occupant belonged to the Moche's highest elite. Excavation in the vicinity of the tomb continues; however, the evidence already points to the tomb's occupant being a wealthy adult male buried with numerous gold objects, tentatively dated to the Early Middle period. According to Bourget (personal communication, 2009), the style of some of the offerings is reminiscent of funerary contents recovered from the tombs at both Sipán and Dos Cabezas; he also suggests that the Lord of Ucupe may represent a character depicted in a sacrificial ceremony found on ceramic vessels. Although the opulence of this new tomb suggests at least some degree of political autonomy and the capacity of its occupant to travel with his wealth on his voyage to the afterlife, it leaves a number of questions unanswered. What type of power did the Lord of Ucupe exercise during his lifetime? Was he the leader of an independent polity or a vassal of Sipán or of Dos Cabezas? With its elite tomb, Huaca El Pueblo has become a key site in the investigation of the region's sociopolitical organization. We can only hope that more such burials are discovered so that attempts may be made at reconstructing the dynastic history of the Zaña Valley.

Fieldwork conducted between 1994 and 2001 at Dos Cabezas led to the discovery of a series of royal tombs (Donnan 2001a, 2007). These tombs provide a wealth of new information on the Moche, their leaders, the exceptional skills of the artisans, and the unusual practice of including miniatures in graves (Donnan 2003). Five of the interred males, who may represent another dynasty of Moche leaders, appear to have suffered from gigantism (Cordy-Collins and Merbs 2008). Salvage excavation at a cemetery in Masanca uncovered 21 unlooted tombs, probably the graves of commoners (Donnan 2006), thus further extending our knowledge of Moche burial practices.

Several tombs likely associated with the lower elite have been discovered at El Brujo and Huacas of Moche (Chauchat and Gutierrez 2006, 2008; Donnan and Mackey 1978; Gutierrez 2008), whereas the Señora de Cao tomb in the Huaca Cao Viejo at El Brujo was certainly part of the upper elite (Franco 2008; Mujica 2007).

The same status may apply to the empty tomb at Huaca de la Luna, located near a large box made of fibers and containing several gold objects including a warrior bag decorated with metal pieces representing a feline (Uceda 2008c). Unfortunately, looting, going back to the colonial period, had been very severe at these two sites and is the main factor explaining the absence of royal tombs.

Looting of the capital, Huacas of Moche, was so destructive that long-term excavation on Huaca de la Luna has so far failed to identify a royal tomb, even though one must have existed. To deny this possibility is to reject the importance of leadership in building these monuments and in leading the urban class in an impressive expansion southward to supplement staple resources in response to the growing needs of the southern Moche state.

The single intact tomb of an upper elite south of the Moche Valley comes from the Virú Valley at Huaca de la Cruz (Strong and Evans 1952). Formerly known as the warrior-priest, the deceased's military character has been contested, and this elderly male may have been active principally as a priest (Mogrovejo 2008). Two elite tombs, both partially looted, have been excavated at El Castillo de Santa (Chapdelaine et al. 2005), but none have been found at Pañamarca. Although based on negative evidence, it can be proposed that most of the upper elite acting as provincial rulers were not interred locally and that their remains were returned to the homeland in Moche or Chicama to be buried in sacred settings according to their rank.

Quilter (2002, pp. 160–161) has summarized four models of Moche regional political organization: single state, northern and southern regions or dual kingdom, valley states with no strong centralized authority, and a confederation of Moche centers with Huacas of Moche as the *primus inter pares* (first among equals). Of these four models, the first may be rejected, mostly because it relies on a monolithic perception of Moche culture. Larco Hoyle's original proposition of the Moche as a unified culture has been proven wrong with the accumulation of data [see Castillo and Uceda (2008) for a detailed account of this profound change in Moche historiography]. The single Moche state is no longer a viable hypothesis, but there the consensus ends.

The fourth model is very similar to the third and will be very difficult to demonstrate, especially if adequate weight is given to all the differences among the respective centers. At stake here is the idea of regional centralization, which seems clear given that each Moche lord or king was capable of concentrating staples and treasures at his center. How can archaeology accord a dominant political role to Huacas of Moche over all the other polities while at the same time suggest that the confederation worked on the basis of political autonomy and sovereignty for all the ruling leaders? Such a confederation would imply a decentralized power and indirect rule by the central leader over his vassals. Politically, such a weak system would have had difficulty surviving over a long period of time, and, moreover, its existence is indeed very difficult to prove with archaeological data.

The second model, of northern and southern regions in a dual kingdom, is asymmetrical regarding political centralization, since it is doubtful that the northern Moche were ever united into a northern kingdom in a similar fashion as the southern Moche state (Castillo and Rengifo 2008). The two-state model is thus not very

promising, although during Late Moche, Pampa Grande, the largest Moche site of its epoch, may have had hegemonic control over the Lambayeque Valley and perhaps further south into the Moche Valley (Shimada 1994a). In fact, it may be appropriate to reformulate this second model as a single Moche state for the southern Moche sphere and a variant of the third model for the northern Moche sphere.

The third model—valley states with no strong centralized authority—assumes that each valley with a royal tomb, such as Sipán in Reque and San José de Moro, La Mina, and Dos Cabezas in Jequetepeque, or with a large center, such as El Brujo in Chicama and Huacas of Moche in Moche, was ruled by a king who could be politically independent. This model applies quite well to the northern Moche sphere, with polities in Jequetepeque, Lambayeque, and possibly Piura for the Early Moche period (Castillo and Uceda 2008). We may ask, however, what level in the political hierarchy of the Lambayeque region was occupied by the Lord of Ucupe at Huaca El Pueblo, the largest Moche center of the Zaña Valley. Was he a vassal of the Sipán dynasty or the ruler of an autonomous polity?

This model is less convincing for the southern Moche. Could El Brujo be politically independent of Huacas of Moche? Scholars have begun comparing the results of work carried out at Huacas of Moche and El Brujo. Although findings point to cultural, ideological, and representational similarities between the two centers, a number of questions remain unanswered, not the least of which concern the nature of the relationship between the ruling elites at the two sites and whether one polity was politically, economically, and militarily dominant over the other. Although the relationship was certainly not static, the usual state of diplomatic affairs was one of collaboration and possibly intermarriage between elites. One recent reconstruction of Huaca de Moche political history proposes that only during its last phase did the civic-ceremonial center of the Moche Valley develop some hegemonic power over its neighbor to the north (Uceda 2008b, 2010). The nature of the relationship between El Brujo and Huacas of Moche will certainly be one that occupies Moche archaeologists for decades to come. And what was the position of Mocollope, second in importance in the Moche settlement hierarchy of the Chicama Valley?

The conflicting results at Huancaco in the Virú Valley (Bourget 2003, 2004, 2010) tend to support the idea of an independent ruler, making a Moche conquest of this valley early in the consolidation of the expansionist southern Moche state less likely. Although architectural similarities point to a link between the builders of Huancaco and of Huacas of Moche, the internal organization of the two monumental buildings, and more specifically the material culture recovered from floors and refuse pits, all indicate that participation in an interaction sphere linking Huancaco's inhabitants to their Moche neighbors to the north did not prevent the former from developing locally distinctive styles. Significant differences with both Moche and Gallinazo culture, especially in ceramics, have led Bourget to propose that the elite group ruling Huancaco and its hinterland expressed their autonomy through an acceptance of only some of their neighbors' stylistic elements. Importantly, these findings challenge the traditional model of Moche sociopolitical history and its view of Moche leaders quickly conquering all of the southern valleys.

Bourget (2004) has offered a date of around AD 600 for the collapse of Huancaco and the subsequent incorporation of the Virú Valley into the southern Moche state.

This revised scenario, discrediting the rapid Moche conquest of the Virú Valley during Phase III or Early Middle Moche, is supported by the results of a research project carried out in 2002 and 2003 in the same valley by Millaire. Basing his project on previous work in Virú (Willey 1953), Millaire (2004b, 2010) found that the monumental portion of Huaca Santa Clara was not Moche but Gallinazo.

The only obstacle to the third model and the idea of multiple valley-sized Moche states in the south is the case that can be made for the Santa Valley and the Nepeña Valley (see Quilter 2002). I have carried out excavations between 1995 and 2008 at several important Moche sites, including Huacas of Moche and Santa. Comparisons of various lines of evidence (artifacts, architecture, burials) gathered over these years support a Moche conquest of the lower Santa Valley (Chapdelaine 2008, 2010a). I argued that both assemblages favor the expansionist state model centered at Huacas of Moche. Differences certainly exist between the two Moche assemblages (Chapdelaine 2008), but evidence of similar behavior in various cultural contexts is overriding. I thus consider the Santa Valley a Moche province under direct control of the southern Moche state (Chapdelaine 2010a).

Whatever label we assign to a political formation, it is clear that Huacas of Moche was the largest site of its time, overtaken by Pampa Grande only very late in Moche history (Shimada 1994a). Centralization at the valley level was achieved early (Billman 2002). No single site could have challenged the central authority of Huacas of Moche during its supremacy, except for Galindo, established during the Late Moche period. The polity ruling Huacas of Moche was the most complex of its time; if Huacas of Moche was not the capital of a state, then no other Moche center qualifies for this honor. The question is why is this site in one of the smallest valleys of the north coast so extensive? Could an early centralization of power explain the capacity of a limited population to construct these huge platforms? The answer appears to be no, and the option of a multivalley power base has been used to explain the size of Huaca del Sol and Huaca de la Luna, leading to the conquest state model (Moseley 1992; Wilson 1988).

Based on available literature, each Moche polity could have been a complex chiefdom or a chiefdom (Alva 1994; Schaedel 1985; Shimada 1994a), a kingdom, an incipient or inchoate state (Makowski 2010), an archaic state, a "Mochicoid" state for Huancaco (Castillo and Uceda 2008), an opportunistic state (Castillo 2010; Castillo and Rengifo 2008), a theocratic state (Uceda 2008b), a territorial state, an expansionist, expansive, or conquest state (Chapdelaine 2008; Moseley 1992; Quilter 2002; Willey 1953), a city-state (Wilson 1997), or a hegemonic city-state (Millaire 2010). The proliferation of Moche states and the acceptance of valley-sized states would presumably lead to a revision of the nature of each polity and its power base. Modified definitions of the city-state or the hegemonic city-state (see Trigger 2003) could gain some support. Ideas of sociopolitical diversity are popular for the moment in Moche archaeology, although most scholars still agree that this diversity is bounded by some overarching presupposition of cultural unity. If not so, the very notion of Moche would be laid to rest! In this regard, religion is viewed as a cohesive driving force for Moche cultural unity that maintained itself over time and space (Donnan

2010). It is very important to look at these cohesive forces because of the now well-accepted division of the Moche realm into at least two entities. Donnan argues that religious institutions were independent of regional political boundaries.

Moche sociopolitical organization is at the center of new formulations and propositions by active scholars (Quilter and Castillo 2010b). No uniform theoretical approach can be imposed, no consensus may be achieved, and a great diversity of viewpoints, mostly of a restricted geographic scale, best describes the current discourse. It is thus difficult and premature to engage in a detailed comparison with other civilizations. The political fragmentation of the Moche into several polities resembles Maya city-states (Webster 1997); it differs from the Andean highland states in its more urban nature (Kolata 1997) and contrasts with the Indus civilization in its highly visible rulers (Possehl 1998).

Craft production

The study of workshops provides a new understanding of Moche craft production, with producers and consumers brought together by a common set of questions. Workshops that produced ceramic, metal, stone, and textiles have been identified (Bernier 2005, 2008; Chapdelaine 2002, 2009; Rengifo and Rojas 2008; Russell and Jackson 2001; Uceda and Armas 1997, 1998; Uceda and Rengifo 2006), and high-tech analyses have been carried out (Chapdelaine et al. 1995, 1997, 2001a, b; Donnan et al. 2008; Fraresso 2007, 2008; Moutarde 2008). More studies are needed to improve our understanding of these various types of production.

Moche civilization is well known for the high density of pottery fragments littering sites and numerous whole vessels displayed in museums around the world. This production capacity was made possible by the use of molds (Donnan 2004). Massive production of fancy vessels has been considered a political means of sending ideological messages. A corporate style was a major tool for state officers, but it is not clear whether pottery style, production, and diffusion were under total state control. After comparing Sicán, Chimu, and Inka decorated ceramics, I personally came to believe that the artistic creativity of Moche potters was not bridled by the state and that the artisans were fully supported in order to produce fancy pottery in large quantities.

Craft specialization, whether autonomous or controlled by an elite, is central to understanding the functioning of cities and major centers (Bernier 2005; Russell and Jackson 2001; Shimada 2001). A detailed account of craft production for the Andes is available (Vaughn 2006). Of importance here is the detailed analysis of a metallurgical workshop at Huacas of Moche (Uceda and Rengifo 2006) that supports the idea that this class of specialists was more important than previously considered. Metal objects were a rare, prestigious good, which places metallurgists above other classes of craft specialists.

Most of the specialists made goods for the elite, and therefore craft production was at the service of a specific interest group occupying the upper echelons of a complex society (Makowski 2008a, b). Distinctive signatures appearing on nonutilitarian products are considered a decisive cultural expression that is

associated with an ethnic group (Barth 1969; Emberling 1997). The ethnic group that we call Moche, or Mochica, is thus an elite group who ruled over a large population that shared the same ancestors through lineages and clans. A growing number of commoners would have styled themselves as being of the same ethnic group as the rulers, mostly under specific circumstances, in order to make the best of this ruler-and-ruled dichotomy. The true nature of Moche ethnicity raises the question of its relationship with the archaeological record, mostly ceramic. It is a very complex subject (Bawden 2005; Bourget 2005).

Various cultures or ethnic groups were in contact with the northern and southern Moche elites (Salinar, Gallinazo, Vicús, Recuay, Cajamarca, Lima, etc.), and assimilation of local groups seems to have been a success, considering the longevity of the rulers' dynamic culture that lasted over five centuries after they took charge politically and ideologically around AD 300. This assimilation process, which ran parallel to the growing strength of the Moche as a dominant power, did not eradicate all ethnic groups, especially Gallinazo (Shimada 2010). The debate that is necessary to fully understand the problematic relation between Moche and Gallinazo remains to be carried out (Millaire and Morlion 2009).

I have argued elsewhere that the Moche rulers at Huacas of Moche imposed their material culture on the urban class to such an extent that even in the intimate private domain of burials (Burmeister 2000), we are not able to recognize traces of other ethnic groups (Chapdelaine 2009). Acculturation and assimilation likely were achieved in a short period of time, perhaps over two generations and certainly less than a century, leading to the impression that ruling elite and commoners were totally Moche by southern Moche Phase III.

Craft production controlled by elites is a key feature of Moche political economy (Wilson 1999, pp. 394–395). Artisans were supported in return for their production, mostly of mass-produced molded ceramic vessels in the Moche style that were decorated with the symbols of the dominant ideology (Demarrais et al. 1996). Craft production is clearly linked to the political and ideological spheres. The evolution of the political environment certainly affected the economy as well as Moche iconography.

Iconography and archaeology

While the iconography of Moche ceramics played a major and positive role in helping early scholars identify Moche as a stratified society with a complex belief system, such studies have suffered from a lack of provenience of the numerous ceramics displayed in museums throughout the world. A significant challenge faced by Moche archaeologists has been fostering a unified approach founded on the incorporation of iconographic and archaeological data—and ethnohistorical sources, when appropriate—into coherent accounts and models of Moche culture. Although comparable to research programs in Mesoamerica, this multidisciplinary effort lacks the written records available to Maya archaeologists (Benson 2008) that provide vital information on Maya sociopolitical organization, such as the presence of city-states. Without written sources, interpretations of politics, society, economics, and religion remain irrevocably tied to available archaeological data.

Major advances have been made in the field of iconography since the discoveries of the royal tombs of Sipán. Various links between iconography and archaeology were made possible by fieldwork and analysis of old and new data (Benson 2008; Bourget 2006; Donnan 2004). It is becoming apparent that Moche elite were actors in the sacrificial ceremony depicted on decorated vessels and temple walls (Donnan and McClelland 1979). This scene is definitely central to Moche religion (Donnan 2010). The sacrificial ceremony may, in fact, unite all Moche polities over time and space. It is depicted on Phase IV ceramic vessels from various valleys (Donnan and McClelland 1999), decorates a monumental wall at the Moche regional center of Pañamarca in the southern Nepeña Valley (Bonavia 1985; Schaedel 1951), and has been identified through prestigious paraphernalia at tombs from Sipán. (Alva 2001; Alva and Donnan 1993) and San José de Moro in the northern valleys (Castillo 2008b; Castillo and Donnan 1994b; Castillo and Rengifo 2008; Donnan and Castillo 1994). Based on iconography, Bourget (2008a) also attempted to identify the third burial at Sipán. He proposed that this high-ranking man with his ritual paraphernalia and regalia could be individual D of the sacrifice ceremony and that he was connected to a number of maritime themes. This study, among others, closes the gap between iconography and archaeology by proposing identifications between real individuals and the subjects depicted in the iconography. That there is a much more immediate relationship between these two records than previously realized is a major advance in the field.

Since the seminal works of Donnan (1978), Hocquenghem (1987), and Castillo (1989), different themes have been investigated through an iconographic approach. Benson (2008) gives us a valuable account on iconography and archaeology, and the recent book by Bourget (2006) on sex, death, and sacrifice gives us solid but highly complex intellectual food to digest. Decoding Moche iconography is not an easy task, and the author uses a large database, initiated 20 years ago (Bourget 1994a, b), to study three related topics. He stresses the importance of symbolic duality in Moche society as well as the liminalities of various rites.

Ritual sacrifice has attracted attention since the discovery of sacrificial sites at Huaca de la Luna (Bourget 2001a, b; Bourget and Newman 1998; Tufinio 2008; Verano 2003). Physical anthropology and iconography have been linked to produce interesting results (Cordy-Collins 2001b, c; Verano 2001a, b). Other aspects of this theme also have been explored (de Bock 2003; Hocquenghem 2008; Uceda 2008a).

Iconographic studies are thus continuously shaping our view of Moche society, with numerous scholars involved in various themes such as portrait vessels (Donnan 2001b, 2004; Woloszyn 2008), masking traditions (Donnan 2008), identification of individual artists (de Bock 2000; Donnan and McClelland 1999; McClelland et al. 2007), textile production (Millaire 2008), the ceremonial calendar at El Brujo (Franco and Vilela 2003), spider symbolism (N. Alva 2008), labret woman (Cordy-Collins 2001a), the illusive ulluchu fruit (McClelland 2008), and the highly controversial Moche pantheon (Campana and Morales 1997; Giersz et al. 2005; Makowski 2003, 2004, 2008b; Morales 2003). The detailed analysis carried out on Moche portrait vessels is instrumental in identifying the sacrificial victims of the central sacrifice ceremony as high-ranking members of the Moche elite (Donnan 2004).

Moche collapse

Partly due to the new chronology and the division of the Moche realm into two geographic entities, any discussion of Moche collapse has recently become much more complex (Bawden 2008). First, Huacas of Moche, the capital of a southern Moche state associated with Phase IV ceramics, did not collapse rapidly before AD 600; instead it thrived until AD 800. Second, the acceptance of several Moche states implies that each polity may have collapsed separately, some at a rapid pace and others at a more gradual rate of decline. Third, Moche collapses also may implicate a different set of factors to explain each polity's decline. With these new parameters, a single explanation for all Moche collapses will be hard to achieve. For the moment, it is much more profitable to discuss specific cases in order to apprehend the archaeological reality.

Catastrophic weather such as mega El Niño events may have been the tripwire that dealt a final blow to an already unstable polity. This external factor, probably linked to internal factors that were eroding the power base of the ruling elite, is used by Bourget (2003, 2004, 2010) to explain the fall and abandonment of Huancaco. The proposed collapse occurred around AD 600, which opened the Virú Valley to an extensive Moche appropriation of cultivated lands. A similar proposition is advanced for the demise of Dos Cabezas between AD 600 and 650 (Moseley et al. 2008). For that particular case, after a mega El Niño event, the final blow came from another environmental catastrophe—massive sand dune incursions, seen as a synergistic consequence of climate fluctuation.

If El Niño and its related consequences are the external factors responsible for the collapse of Huancaco and Dos Cabezas, then two separate polities from the northern and southern spheres suffered a rapid decline within a couple of generations. A more gradual collapse is possible for other northern polities as well as for the southern Moche state.

Regarding southern Moche, the abandonment of El Brujo has not been studied in great depth, but Huaca Cao Viejo was occupied until the end by an elite group using only Phase IV ceramics (Franco et al. 2003). The same conclusion is confirmed at Huacas of Moche. One question remains though, when was El Brujo abandoned? It could have been well before Huacas of Moche's collapse around AD 800.

The abandonment of Huacas of Moche was certainly gradual, even if its monumental buildings were affected by torrential rains caused by a mega El Niño (Uceda and Canziani 1993). Several radiocarbon dates from features near the actual surface forced us to discard the idea of a rapid decline for this key settlement (Chapdelaine 2000). An independent line of evidence is provided by the analysis of faunal remains from the same layers dated between AD 600 and 800. The zooarchaeological team was specifically looking for bio-indicators of past El Niño events. To verify the existence of these catastrophic events, they were looking for exotic fish originating from the hot waters of Ecuador that should have moved southward, as they do today during El Niño oscillations (Rosello et al. 2001; Vásquez et al. 2003). Surprisingly, the zooarchaeologists did not find a single specimen to suggest the occurrence of an El Niño. In the light of our radiocarbon dates, it appears to me that zooarchaeologists did not find bio-indicators of an El

Niño event because the analyzed samples came from archaeological layers that accumulated after the natural catastrophes proposed for the period between AD 550 and 600.

A new hypothesis developed by Uceda and Tufinio (2003) and consolidated later by Uceda (2008b) puts forward a two-phase history at Huacas of Moche. During the first phase, platform I at Huaca de la Luna, the old temple, was the most important monument and kept its power for several centuries until around AD 600, corresponding with the southern Moche state climax. This platform was then abandoned after the single entrance to the great plaza was sealed. Platform III, the new temple, which has no architectural link to the former building, became the new place for religious ceremonies and rituals. At the same time, the last building phase occurred at the Huaca del Sol, giving this potential palace precedence over Huaca de la Luna. This second phase is related to the maintenance of a strong urban class, whose domestic occupation dates between AD 600 and 850. Uceda (2008b) has given a theocratic flavor to the first phase and a more secular character to the second, maintaining Huacas of Moche as the capital of the southern Moche state. He argues that the collapse of the old temple around AD 600 is the end of the theocratic model of governance and that a new southern Moche state, guided by a strong civil power, led to the development of corporatist groups. This reconstruction of Huacas of Moche also suggests that the old temple decline was provoked by multiple factors, including external environmental events and internal social stresses such as competition between the religious class and the new urban class.

One external factor proposed by Uceda requires comment. He mentions the loss of control over conquered territories in Chao, Santa, Nepeña, and possibly Virú to explain the demise of the old temple at Huaca de la Luna. I personally disagree, based on radiocarbon dates from Santa province that contradict the hypothesis that the old temple was sealed and abandoned around AD 600 after losing its provinces (Chapdelaine 2008, 2010a). The radiocarbon dates show without doubt that Santa province was still flourishing between AD 600 and AD 775. The decline of the southern Moche state happened during the 8th century AD, and, if Uceda is right, the Guadalupito elite were under direct control of the new elite centered at Huaca del Sol. It is not possible, based solely on radiocarbon dates, to suggest that Huaca del Sol collapsed before or after its provinces.

The collapse of the southern Moche state can no longer be related primarily to external factors, either cultural or environmental. Instead, the decline of its capital, Huacas of Moche, appears to be the result of internal factors. Erosion of political power and ideology related to competition within the elite attached to the two monumental buildings could best explain the collapse of the southern Moche state.

The Jequetepeque Valley seems to have witnessed the last of the Mochicas (Castillo 2000, 2001a, 2003, 2008a). The San José de Moro project is providing an enormous quantity of well-controlled data, mostly from burials. The elite were able to maintain its position until being totally replaced by a new elite from Cajamarca in the 9th century AD. Castillo advocates political stress, in other words, the elite's decline because of eroded power and factionalism. Failure of the dominant ideology could be the best overall explanation for most Moche collapses (Castillo and Uceda 2008).

Warfare

Warfare is a topic that should be analyzed more systematically. For the moment, two factions exist among scholars interested in reconstructing Moche polities as states. The first faction sees warfare as mostly ritual (Alva and Donnan 1993; Bourget 2001a, b; Donnan 2001b; Hocquenghem 2008; Topic and Topic 1997a, b); they are more inclined to favor a total political fragmentation of Moche power, arguing for small Moche states at the valley size. The second faction sees warfare as an obligatory strategy of expansionist states to develop and maintain power (Billman 1997; Chapdelaine 2004a; Quilter 2002, 2008; Verano 2001a; Wilson 1987). Both factions may be right, but if ritual battles are the most popular iconographic representation, then human sacrifice of war prisoners indicates that violence was heavily ritualized. As asked by Quilter (2002), in what kind of wars were the Moche involved? How were the prisoners captured for their rituals? Warfare at the intravalley or intervalley level has direct implications on Moche sociopolitical organization.

From a theoretical point of view, is it possible that a state could not be involved in warfare? For many scholars, a true state must have the strength to exercise power (Arkush and Stanish 2005; Carneiro 1987; Haas et al. 1987); coercion is necessary and armed forces are needed. Heavy reliance on coercive action is not the best strategy, and maintenance of power under terror should not provide longevity to any state formation. Voluntary obligations supported by moderate coercion might have been the strategy for most Moche rulers to maintain their authority. Although different in several aspects from contemporaneous Maya rulers (Benson 2010), Moche rulers were able to accumulate wealth and keep it for their ultimate journey.

Ritual and political warfare are not mutually exclusive, and different approaches such as physical anthropology and mtDNA analysis should be effective tools to resolve this issue. Recent studies shed some light on the biological relations between different Moche centers; they are relevant since there is a relationship between sacrificial victims (Bourget 2001a, b, 2005) and normally interred individuals in several locations at Huacas of Moche (Shimada et al. 2005, 2008). The origin of these sacrificial victims is the center of a debate, which is linked to the nature of Moche sociopolitical organization. Three options are likely: the victims were from different valleys controlled by the Moche, including the possibility that they were members of the Moche ethnic group; the victims were taken from Huacas of Moche or from communities of the Moche Valley; or the victims are non-Moche captured during expansionist wars. From mtDNA analysis (Shimada et al. 2005, 2008), the sampled sacrificial victims from Plaza 3A pertain to the same closed population as the sacrificers and urban residents. These results support the proposition that the sacrificers and the sacrificial victims at Huaca de la Luna were of the same ethnic group, as well as the model that proposes that the sacrificial victims represent local elites who lost competitions in ritual battles with one another.

A dental study of the same population (Sutter and Cortez 2005) produced results that support the second model, that the victims were nonlocal warriors captured

during warfare with nearby polities. A second study using the same epigenetic dental traits added a new set of sacrificial victims from Plaza 3C of the same Huaca de la Luna complex (Sutter and Verano 2007). The authors argue that the sacrificial victims from Huaca de la Luna Plaza 3C are adult male warriors taken in combat with nearby competing polities (Moche, Gallinazo, or both), whereas individuals of the Plaza 3A sample likely came from competing polities in more distant valleys. The dental results confirm the second model through complex statistical methods. Both samples of sacrificial victims from Huaca de la Luna are distinct from the other selected samples from Huacas of Moche. If we accept the second model, the foreign origin of the Moche sacrificial victims adds to the importance of political warfare to understand the emergence and expansion of the southern Moche polity.

Unfortunately, the sacrificial victims from Plaza 3C have not yet been analyzed for mtDNA. The controversy between mtDNA and epigenetic dental traits will remain until they are analyzed. However, the nature of these bioarchaeological approaches is complex, and new studies must be performed as well as other new techniques, such as strontium and oxygen isotopic analyses (which have been used successfully at Teotihuacan [Price et al. 2000]). In a recent attempt to verify the feasibility of studying Moche migration into the Santa Valley, guinea pig bone samples from both Moche and Santa Valleys were analyzed for strontium isotope content (Knudson 2009). Although the objective was to determine a distinct local signature to eventually compare with human remains, the Moche and Santa Valleys were not distinguishable using strontium isotope analysis.

Conclusion and future research

Uceda and Mujica (2003b) offered final comments on selected topics that Moche archaeology should address in the near future. I share some of their preoccupations: frontier delimitation of the Moche realm, territoriality and outside relations, the need for a larger sample of sites and a stylistic sequence to improve the related historical process, and Moche origins and the role of cultures such as Gallinazo, Vicus, and Salinar.

The origin and development of this civilization is still puzzling to most scholars. The various lines of research are producing more variability at the valley level, and it is thus very difficult to look for a single source of origin. The Moche civilization is linked to the emergence of a strong elite capable of centralizing different sources of power. This phenomenon may have been very rapid, occurring within a century or two. Were the central valleys of Chicama and Moche the core of this elite development? Additional data on the Early Moche period from the north and south are needed to answer this question. The unity or monolithic vision of this culture has been ruled out, which gives more complexity to the quest for Moche origins. The development of Moche to a certain level of complexity and then its fragmentation into several entities did not occur in a vacuum. The north coast was fully inhabited prior to the emergence of this dominant elite, and all the interactions between various ethnic groups, though not easy to find in the archaeological record, should be studied more appropriately in the near future.

A revised stylistic sequence to bring together the northern and southern Moche ceramic sequences is one of the biggest challenges for Moche archaeologists. A workshop is badly needed to gather interested scholars to share their data and try to make Larco Hoyle's southern sequence as equivalent as possible to the north. Being a researcher in the southern sphere, I am not aware of the ceramic diversity associated with the northern Middle Moche. I only know that the northern style is not similar to its coeval Phases III and IV styles of the south. The revised chronology of Phase IV, spanning probably 400 years, also makes it more complicated. The comparison of domestic ceramics also should be completed (Gamarra and Gayoso 2008). A detailed comparison of the Jequetepeque sequence with the combined El Brujo-Huacas of Moche sequence should be the first step before adding the sequences from other valleys. A better understanding of these various ceramic sequences will be instrumental in the reconstruction and modification of the chronological framework. More radiocarbon dates will be necessary to consolidate this enormous task of correcting the confusion within ceramic typology and chronology.

The sampling of excavated Moche sites is definitely skewed. Major civic-ceremonial Moche sites have been the object of most long-term projects. Comparisons between these centers should be exciting in the coming years. Our vision of Moche society is far from complete if we limit ourselves to the study of large residential compounds and monumental platforms. Although less attractive, exploration and excavation of rural sites should be addressed on a larger scale in the future. The shift from major sites to rural or secondary sites could be very helpful in establishing more detailed social, economic, and ideological links between large centers and their hinterland.

Intercultural interaction is a subject that should be studied more. It may be productive to look at the exchange of prestigious goods, which will allow the insertion of diplomacy within the political strategies of ruling elite. Comparison of utilitarian goods also could be very stimulating. Domestic wares of Moche, Gallinazo, Vicus, Cajamarca, and Recuay potters may open a new understanding of the relationship between these cultures. To gain some understanding between coastal and highland groups, collaboration must be set up to look at various collections. Such research could be carried out at the valley level and subsequently between valleys. Regional synthesis of cultural contacts would clarify the role of each cultural group in the making of this mosaic of cultures. The complex case of Gallinazo is already part of the agenda (Bennett 1950; Chapdelaine et al. 2009; Choronzey 2009; Fogel 1993; Millaire and Morlion 2009; Shimada and Maguiña 1994; Uceda et al. 2009), Recuay has been touched on (Lau 2004a, b; Mackey and Vogel 2003; Proulx 1982), the Moche-Vicus relation should be reopened (Hocquenghem 1998; Jones 2001; Kaulicke 1992, 1994; Makowski 2010; Makowski et al. 1994), and the Cajamarca cultural intrusion in San José de Moro is now well documented for burials (Bernuy and Bernal 2008; Rucabado 2008; Rucabado and Castillo 2003) and in the fortified center of Cerro Chepén (Rosas 2007). Additional fieldwork at Pampa Grande, the northern Moche capital during Phase V, is likely to provide valuable information on many aspects of Late Moche

archaeology, such as the Gallinazo-Moche interaction and the rhythm of its decline and abandonment.

Frontiers are certainly a subject that will require more effort in the years to come. Not only must the limits of the Moche realm be studied but also population movements. Migration is used more frequently to explain culture change, and with the expansionist state or multiple-state models, demographic contraction and expansion should imply population exchange and movement.

Defining the limits of the Moche realm will have to make progress in order to differentiate the physical occupation from the area of influence of Moche polities. Extensive surveys to identify Moche settlements and to develop settlement hierarchies are needed in the frontier valleys. For the northern frontier, the upper Piura Valley is the sole area to further our understanding of the complex relationship between Vicus and Moche, which has been a riddle (Castillo and Uceda 2008). More research is needed to sort out the various possibilities of explaining the role played by the Moche in this northern portion of the Moche realm.

For the southern frontier, work initiated in the Casma and Culebras Valleys should be pursued. A comprehensive survey of the lower Huarmey Valley is needed to assess this southern frontier. The first step will be to verify the integrity and cultural affiliation of Moche sites identified and reported several decades ago (Bonavia 1982). The results, if they show a significant Moche presence, may help change the actual preference of including the extreme southern valleys (Casma, Culebras, and Huarmey) in a zone of Moche influence instead of being incorporated in the zone dominated directly by Moche rulers. Most important for the southern Moche frontier is to start a long-term project to study Pañamarca. This civic-ceremonial regional center in the Nepeña Valley is the key to solving basic questions regarding southern Moche state expansion. Contributions from Pañamarca will certainly be the starting point for the next summary of recent advances in Moche archaeology.

Moche archaeology is progressing at a steady rate, and the large amount of fieldwork in progress will provide data for analysis that should help us understand this intriguing civilization. The monolithic perception of Moche is now behind us, and although it is tempting to build a unified history, scholars seem to work more effectively at the valley level. Regionalism should not, however, prevent us from comparing the Moche to other civilizations. The comparative approach might make the Moche a genuinely archaeological case for discussing larger issues such as state formation, political unification and fragmentation, core-periphery relations, and collapse.

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