



Research Article

Textiles, dates and identity in the late occupation of the Huacas de Moche, Peru

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Archaeological cultures present allegories of ethnic identities across the centuries or millennia but such conceptualisations are necessarily incomplete and lack the resolution to explore transitions between cultures. Here, exploration of the archaeological contexts, production methods, stylistic variation and radiocarbon dating of 20 preserved textile fragments facilitates an examination of cultural change at Huaca del Sol (Huacas de Moche, northern Peru). While occupants of the site experienced many outside cultural influences, including those from the highland Wari Empire, continuity in textile traditions suggests that some sense of Moche identity was maintained through the tenth century and after the perceived end of the Moche culture.

Keywords: South America, Huaca del Sol, Moche, Wari, radiocarbon dating, textiles, identity

Introduction

Ethnicity and other aspects of identity have long been of interest to ethnologists (e.g. Barth 1969; Cohen 1978), archaeologists (e.g. Jones 1997; Hales & Hodas 2010) and historians (e.g. Hall 2000; Sun 2021). While ethnicity can be expressed in many ways, archaeological investigation of identity relies mostly on material remains, linguistics (Heggarty & Beresford Jones 2012), and, for later periods, ethnohistories (Wester 2021). Yet, essentialised

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‘archaeological cultures’ have long defined and described prehistory in the Central Andes, where artefact types seem to fit neatly into spatial and temporal grids or have been made to do so. But coloured regions on maps and neatly stacked sequential chronologies inhibit exploration of contemporary or diachronic transitions between one essentialised culture and the next.

Here, we follow Hornborg and Hill’s (2011: 2) definition of ethnic identity as a means by which a group’s distinctiveness may be expressed, developing in relation to external sociocultural forces. Ethnicity exists in a dynamic relationship with alterity: ‘us’ versus ‘them’ (Lau 2012). While we recognise that identity is nuanced, flexible, hybrid and varied, it is through the examination of cultural capital that we discern what was meaningful and valuable to the people whose pasts we investigate (Bourdieu 1986). For the ancient Andes, textiles were one of the most valuable and meaningful forms of material culture and the expression of identity (Murra 1962; Oakland Rodman 1992). We offer a case study that tackles the notion of identifying identity, primarily through textiles, in a transition period on the north coast of Peru at one of the region’s most noted sites, the Huacas de Moche archaeological complex.

Culture history and Huacas de Moche

The Moche archaeological culture is one of the best-known prehistoric Andean cultures after the Inca, famed for its brightly decorated temple complexes (huacas), elaborately buried elites—such as the Lord of Sipán (Alva 2015)—and its ‘veristic’ art, especially on numerous painted ceramic vessels. The Moche have also attracted scholarly attention owing to their status as one of the earliest complex societies in South America, the nature of which has been debated for many years (Quilter & Castillo 2010; Quilter & Koons 2012).

Construction at Moche is generally dated as starting in the third or fourth centuries AD, during the Early Intermediate period (AD 1–650), with its largest architectural complex at Huacas de Moche (Figures 1, 2, 3 & 4; Uceda *et al.* 2016). Over the following two centuries, Moche and other huaca complexes grew and prospered with significant sociopolitical changes occurring *c.* AD 650. While the causes continue to be debated (Uceda *et al.* 2021), these changes coincide with the arrival of the Wari, a cultural and political power based at the southern highland city of Huari. The Wari empire’s influence ranges from direct military intervention to indirect cultural shifts, and its effects on local traditions were so strong that this period is considered a distinct era, the Middle Horizon (AD 650–1000), though the temporal waxing and waning of Wari influence varied in different regions (Jennings 2010).

The Wari heartland eventually fragmented into small competing chiefdoms (Dulanto 2008) while northern and southern Moche regions became the domains of two archaeological cultures, Lambayeque (or Sicán) and Chimú, respectively, in the Late Intermediate period (AD 1000–1450). North-coast archaeologists generally consider *c.* AD 850 to be the end of the Moche culture. Lambayeque dates to AD 800–1375 (Shimada 1995) and was conquered by Chimú in three campaigns, perhaps beginning in the early 1300s, and completed by the mid-fifteenth century (Mackey 2009). The picture is complicated by the fact that there is no clear date for the beginning of Chimú at its capital city, Chan Chan, in the lower Moche Valley which is not far from Huacas de Moche. Furthermore, the dates proposed for early Lambayeque overlap the new dates we have obtained for the occupation of the Huacas de Moche, raising

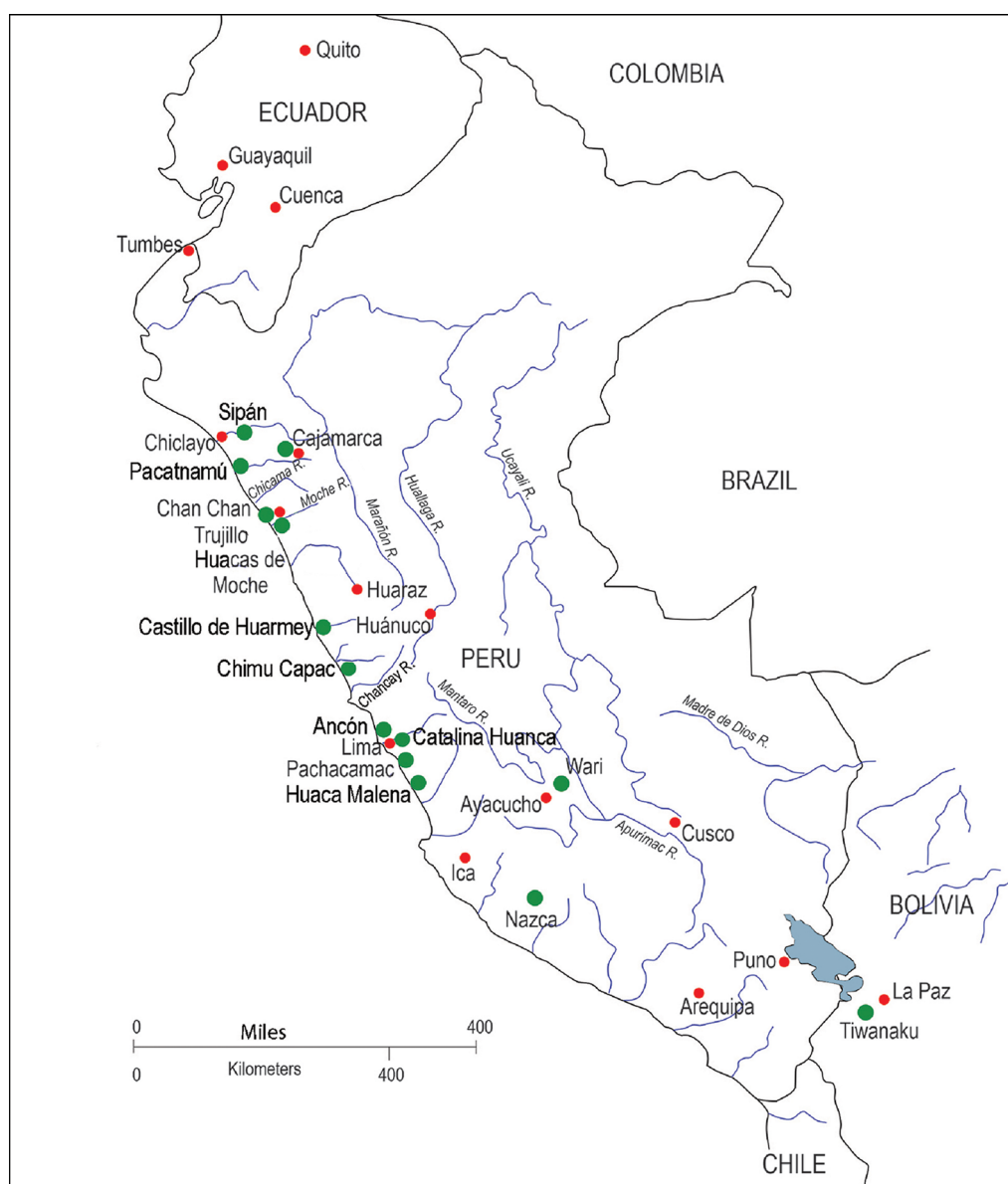


Figure 1. Map of Peru showing the location of sites mentioned in the text: red dots indicate modern towns; green dots indicate archaeological sites (figure by authors).

issues concerning culture change in the region. It is precisely these concerns that make our analyses relevant to the study of ethnogenesis and identity.

The site of Huacas de Moche plays a significant role in understanding central Andean pre-history with numerous scholars drawn to it due to its large size and proximity to Trujillo, one of Peru's largest modern cities. The first archaeological research at the site was conducted by German archaeologist Max Uhle in 1899–1900 (Uhle 1913). Subsequent large-scale

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Figure 4. Left) aerial view of Huaca del Sol annotated with Sections 1–4 and excavation units in Section 4; right) detail of level 2 features in the western portion of excavation unit 1 (figure by authors).

While excavating the Huaca del Sol, Uhle found ‘foreign’ ceramic and textile styles among ‘classic’ Moche remains. He associated these artefacts with the Tiwanaku Culture of Bolivia although subsequent research reclassified the artefacts as Wari (Menzel 1964, 1977). Although outside influences affecting north-coast cultures were thus recognised a century ago, one late-twentieth-century school of thought saw environmental catastrophes, including mega El Niño events, as contributors to social change (Moseley 1983; Craig & Shimada 1986). In recent studies, however, sociopolitical responses to such climatic events have been championed with emphasis on cultural flexibility and resilience (Sandweiss & Quilter 2008; Caramanica 2022). Similarly, while Moche culture was thought to have ended in the second half of the eighth century it is now recognised as having continued, although significantly changed, well into the ninth century and, as our research suggests, even later.

Huacas de Moche and Huaca del Sol

Huacas de Moche covers approximately 50ha in the lower Moche Valley and consists of three major constructions: Huaca del Sol and the Old and New Temples of Huaca de la Luna

(Figure 2). Platforms, plazas and a residential sector occupy the plain between these buildings. The Old Temple of Huaca de la Luna was the main focus of activity early in the development of Huacas Moche, but construction stopped *c.* AD 650 and the New Temple was built next to it. The early use of Huaca del Sol is uncertain but it attained its present size in its final phase with the inclusion of a residential compound and a possible elite residence on its summit (Figure 4).

Huaca del Sol was excavated by Uhle (1913) and, more recently, by Moisés Tufinio and colleagues (2014); both excavations noted a cemetery on the large southern terrace, now called Section 4 (see Figure 4), from which textiles and other artefacts have been recovered (Zavaleta *et al.* 2021; Oakland 2022; Pariona 2022). Tufinio's investigations concentrated in units 1–3, three areas of Section 4. On the surface of unit 2 were hearths, ashes and two *quincha* (wattle-and-daub) structures; a looting hole dug into the mound revealed deeper plastered walls. Unit 3 held rooms and hearths.

The cemetery was uncovered in unit 1. Mingling of bones and artefacts in the upper levels and disturbance in lower levels suggests the reuse of the area for burials over time. Recovered material includes: Moche IV ceramics—*c.* AD 650–850 at Huacas Moche, which was Moche ceramics' penultimate phase—mixed with textiles and ceramics that are not Moche in style; Casma impressed and stamped pottery; a few Wari and Cajamarca ceramics; and hundreds of fragmented Moche clay trumpets and whistles (Tufinio *et al.* 2013: fig. 65). Within and below the disturbed levels, the platform was filled with cellular chambers each measuring about 1 × 1 m or 1 × 2 m, made by removing adobe bricks from the floor. These chambers were former tombs, but all except three (tombs 1, 2 and 3) lacked burials. Beneath 0.48 m of fill, Tufinio excavated organic material from 20 *Pozos*, chambers filled with burial remains but not clearly tombs, and 10 groups of clustered artefacts. Few textiles have been recovered at Huacas de Moche, but the preservation of those in Section 4 is exceptional, allowing us to date them and to use dates and styles to infer cultural change at Huaca del Sol.

The textiles

More than 200 textile fragments were excavated from the cemetery of Huaca del Sol units 1 and 2. From these we selected 20 textile fragments and sampled 5–7 yarns (between 40 and 80 mm in length) from each. Fibres represented both cotton and camelid hair and the textiles were both plain weave and decorated fragments. We selected examples from tombs 1, textile samples (# 4, 5, 7–10), 2 (#11) and 3 (#6) from pozos 4 (#14), 13 (#15 & 20) and 17 (#1–3) and from artefact groups 4 (#12) and 5 (#13, 16–19) (see online supplementary material (OSM) for details). Textiles 1–15 were previously illustrated and reported (Pariona 2022; Zavaleta *et al.* 2021). Our selection is representative of the total collection and the 20 examples were classified into four types based on image and production method.

Moche textile types from Huaca del Sol appear strikingly similar in both pattern and structure to early Moche textiles reported from Huacas de Moche (Gayoso 2007; Fernández 2008), Sipán (Prümers 2007), Virú (Surette 2015) and Pacatnamú (Donnan & Donnan 1997). All Moche textiles were woven with cotton fibres spun in a horizontal method that produces yarn oriented in the S direction. These S-spun cotton yarns were used singly or paired (#14) and are particular to Moche and other northern groups. Single S-cotton yarns sharply contrast with yarns produced in southern and highland regions where the

vertical, drop spindle is used, a method that produces yarns in a Z direction that are always plied (containing multiple strands).

The Huaca del Sol textiles that we examined were woven in slit-tapestry (#7), supplementary wefts (#2, 8, 13, 17–18) and double cloth (#11), which are all techniques used in early Moche textiles. Cotton twill weaves common to the early Moche were recovered, but most Huaca del Sol Moche types were woven with a cotton base and patterned in supplementary-weft techniques in diamond grid patterns that resemble twill structures (O’Neale 1946). Weft-based designs include familiar Moche figures such as the ‘crab-man’ (#6, Figure 5a) and a humanoid with a long snake belt (#12, Figure 5b).

A second textile type discovered at Huaca del Sol is woven in warp-patterned technique with Moche S-spun cotton yarns and camelid fibre yarns in supplementary-warps (#3), float weaves (#16) and warp substitution (#19–20) (Oakland 2022). Warp-patterning is generally considered highland in style and most highland textiles are woven with camelid fibre yarns (Rowe 1977). This Huaca del Sol type combines Moche S-spun cotton used in weft and in warp along with camelid fibre and is often woven in long, narrow panels. A large fragment (575 × 170mm) discovered near the female in tomb 1 (#5) suggests that this warp-patterned textile may have formed part of this individual’s clothing. The style appears to be a hybrid type woven with local Moche cotton yarns in highland techniques. For this reason, we named the style Highland-Moche.

Examples of tie-dye—a distinctive Wari textile—were excavated on Huaca del Sol (Pariona 2022: photographs 50 & 56), but due to their small sizes (<60mm) we chose to date other camelid-fibre Wari-associated textiles. One is woven in a discontinuous warp and weft technique (#4) known as Wari or Nasca-Wari style and another is woven in dovetailed-tapestry (#15) similar in design to a fragment excavated by Uhle at Pachacamac (Pariona 2022: fig. 48b).

A fourth category of textiles from Huaca del Sol, known as Moche-Wari, combines both Moche S-spun cotton yarns with Wari imagery. Examples include the Wari staff-bearing figures patterning a tapestry bag (#1, Figure 5c) (Pariona 2022: 140) and a tapestry panel with similar figures excavated by Uhle in the same location (Uhle 1913: fig. 16.1; O’Neale & Kroeber 1930: fig. 13; Menzel 1977: fig. 89; Oakland 2022: figs. 4 & 15). Another Moche-Wari tapestry from Huaca del Sol possibly formed the bottom portion of a man’s shirt (#10), and Moche-Wari garments are also reported at Huaca Pucllana (in Lima), Chimú Capac and Ancón (Young-Sanchez 2000; Oakland 2020; Chuchón 2021). Other narrow tapestry bands (#9) from Huaca del Sol may originally have been part of these Moche-Wari shirts. Huaca del Sol textiles are closely related to the Moche-Wari textiles recovered from the large destroyed cemetery at Castillo de Huarmey (Prümers 1990, 2001; Laszcza & Prządka-Giersz 2020) and also to Moche-Wari styles—identified by their S-spun cotton yarns—outside of Moche at Chimú Capac (Oakland 2020), Catalina Huanca (Thays & Cornejo 2021), Huaca Pucllana (Chuchón 2021), Huaca Malena (Ángeles & Pozzi-Escot 2001) and Ancón (Young-Sanchez 2000).

Isotope and dye analyses

Fibres were taken from 13 of the 20 Huaca del Sol textiles for further analyses. We compared the stable carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) isotope values of the Huaca del Sol textiles to



Figure 5. Textiles incorporating Moche and Wari images: a) crab man; b) snake belt man; c) Wari staff-bearing figures (figure by authors).

fibres interpreted as primarily of highland and coastal origins from the Chancay Valley and Pacatnamu, respectively (Szpak *et al.* 2015, 2018) (Figure 6; see OSM). The Chancay Valley textiles feature highland camelid fibres (low $\delta^{13}\text{C}$ values and low bivariate isotopic variation) whereas the Pacatnamu textiles present isotopic compositions with high $\delta^{13}\text{C}$ values uncommon to the highlands and high bivariate isotopic variations, suggesting that these camelid fibres were obtained from coastal camelids. Although the Huaca del Sol sample is small, the data show that the textiles were not exclusively derived from wool imported from the highlands and some of the animals were likely raised at lower altitudes and had diets high in C_4 plants, likely maize. The overall pattern of isotopic variation in the Huaca del Sol samples is similar to fibres from textiles from the Virú and Santa valleys, south of Trujillo (Szpak *et al.* 2015, 2019), and from Pacatnamú to the north, all of which have been interpreted as being predominantly composed of wool from non-highland camelids.

Dye analysis, using liquid chromatography-mass spectrometry (LC-MS) and surface enhanced Raman spectroscopy (SERS), was conducted on 18 samples from 12 of the Huaca del Sol textiles (Table S2). Carminic acid was found in all red fibres identifying the dye as cochineal (*Dactylopius coccus*). Two blue and blue-green fibres were composed of indigotin, indirubin and carminic acid indicating that indigo and cochineal were both used, perhaps to dye the textile purple. An as-yet-unidentified flavonoid dye was used for yellow. In addition, ellagic acid was in almost all samples suggesting a high-tannin source from the

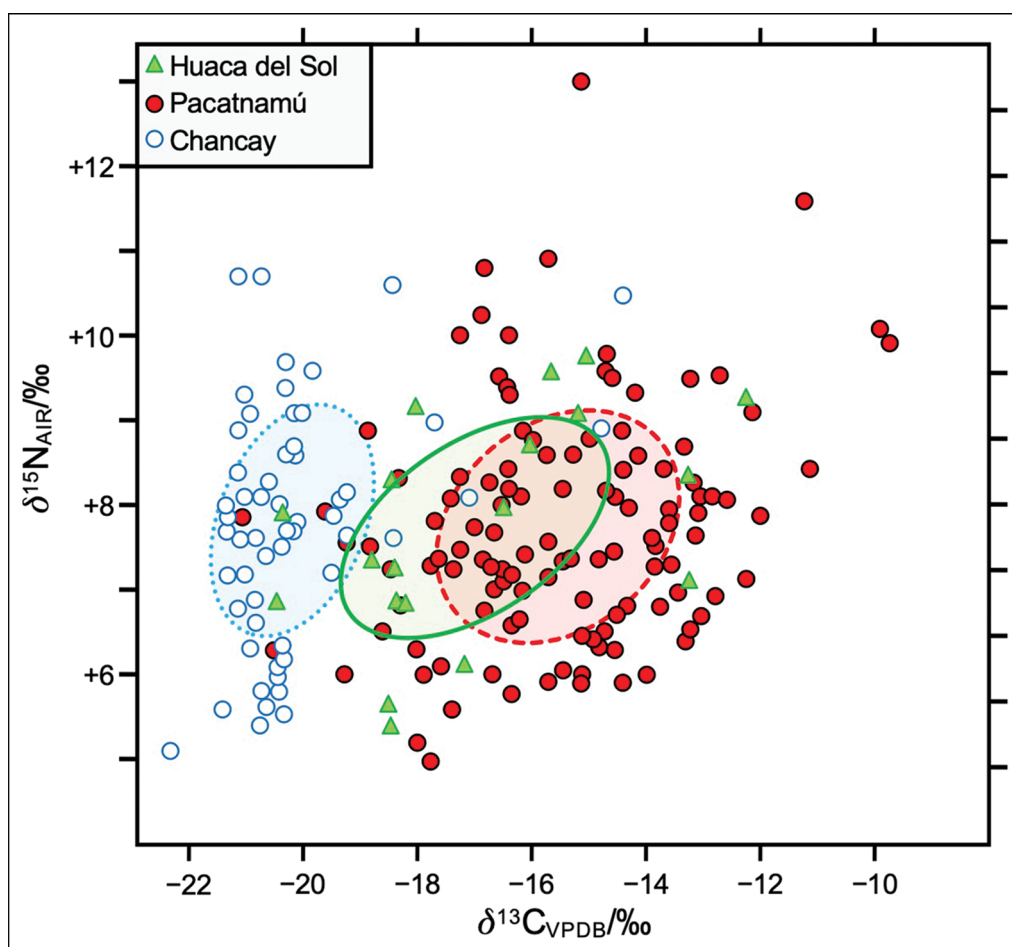


Figure 6. $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values of camelid hair from the Huaca del Sol textiles compared with fibres of highland (Chancay Valley) and coastal (Pacatnamu) origins (figure by authors).

soil. All these dyes have been reported from Peruvian textile collections (Armitage *et al.* 2019) and cochineal was previously identified in two Moche textiles (Phipps 2010).

Radiocarbon analyses

Twenty samples, representative of the complete collection excavated in 2013 from unit 1, were directly dated using accelerator mass spectrometry (AMS) (Table 1). These dates were subsequently calibrated in OxCal 4.4 (Bronk Ramsey 2021), using the SHCal20 Southern Hemisphere calibration curve (Hogg *et al.* 2020). The calibration chart (Figure 7) presents the dating results, with the highest confidence calibration levels falling in the tenth century AD. The date ranges for three Moche style and three Highland-Moche samples straddle the AD 1000 line, while the dates of the Wari and Moche-Wari samples range slightly earlier.

Table 1. Calibrations of 20 AMS dates. Columns refer to: style/culture of the textile, reference number for this article, laboratory number, and standard deviation of the uncalibrated date. The rest of the columns refer to the percentage probabilities from high to low of the dates falling into the time ranges in the adjacent column.

Style/Culture	No.	DAMS #	¹⁴ C Date (AD)	Error (68%)	High-Probability	% Prob.	Mid-Probability	% Prob. 2	Low-Probability	% Prob. 3
Moche-Wari	1	45503	1137	22	893–941	46.5	952–995	43.8	1005–1018	5.1
Moche	2	45504	1044	22	991–1049	63.3	1084–1142	32.2	NA	NA
Moche-Highland	3	45505	1109	20	967–1024	79.7	901–924	15.8	NA	NA
Wari	4	45506	1151	22	893–993	95.4	NA	NA	NA	NA
Moche-Highland	5	45507	1065	20	989–1044	94.4	1124–1129	0.6	1095	0.5
Moche-Highland	6	45508	1132	19	957–995	44.8	895–935	43.2	1004–1019	7.5
Coastal	7	45509	1171	22	888–989	95.4	NA	NA	NA	NA
Moche	8	45510	1128	21	957–995	43.2	895–936	40	1002–1020	12.3
Moche	9	45511	1121	20	962–1022	63.3	897–930	32.1	NA	NA
Moche	10	45512	1139	21	893–940	47.7	953–994	44.1	1007–1017	3.6
Moche	11	45513	1120	21	961–1022	64.3	897–931	31.2	NA	NA
Moche	12	45499	1104	22	967–1025	82.5	900–925	12.9	NA	NA
Moche	13	45500	1108	19	969–1024	83	903–921	12.5	NA	NA
Moche	14	45501	1052	23	991–1049	74.8	1085–1139	20.7	NA	NA
Wari	15	45514	1149	19	893–943	52.2	951–993	43.3	NA	NA
Moche-Highland	16	45515	1052	19	991–1048	82.1	1086–1110	7.9	1117–1135	5.5
Moche	17	45502	1044	20	991–1049	65.8	1085–1140	29.7	NA	NA
Moche	18	45516	1146	20	893–994	95.4	NA	NA	NA	NA
Moche-Highland	19	45517	1157	21	893–991	95.4	NA	NA	NA	NA
Moche-Highland	20	45518	1045	20	991–1049	67.7	1085–1140	27.8	NA	NA

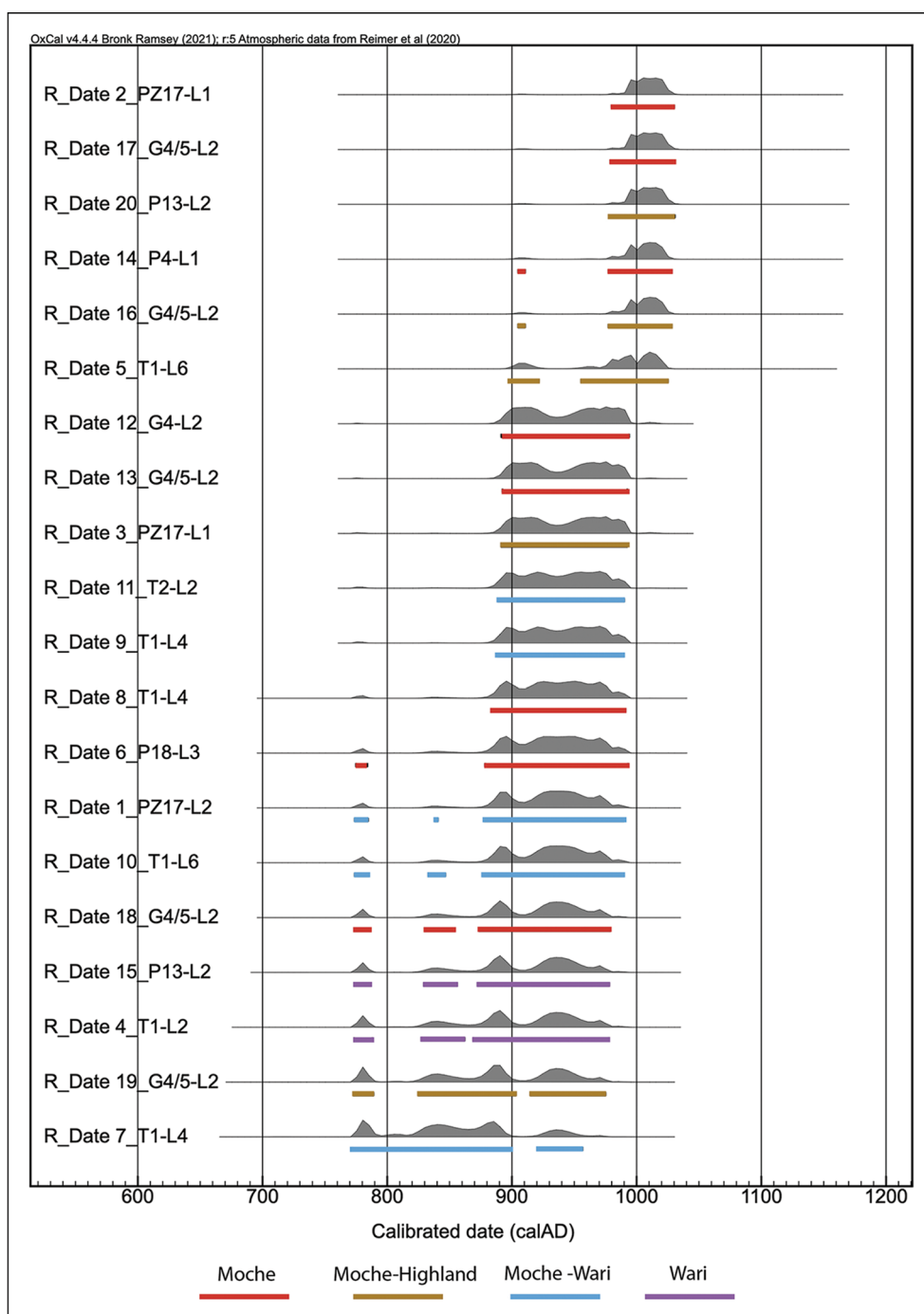


Figure 7. Calibrations of 20 AMS dates. R Date codes include the textile number and the excavation context as presented in the OSM and Figure 4 (figure by authors).

The six textile samples from tomb 1 were discovered in levels 2, 4 and 6. Tomb 1 was reopened and reused multiple times, probably with the additions of textiles into the tomb with each refilling (Tufinio *et al.* 2014: 163–4). The condition of the tomb 1 textiles—most torn into small fragments—suggests that earlier burials were disturbed as the tomb was reused and that fragments left on the surface became mixed with tomb fill during subsequent rituals at different periods. Uhle (1913: 111) made a similar observation upon discovering fragments of a Wari ceramic cup on the surface of the cemetery and a sherd of the same cup plastered into the closing wall of a later tomb. Some Wari and Moche-Wari textiles may have been heirlooms when they were added to the burials, but they remained part of a living culture at the time of their deposition and part of a period of change.

Our AMS dates represent the time of the harvesting of the cotton and camelid hair used to make the textiles, yet these taphonomic and social factors involved in their deposition present complications that urge caution in dating the burials themselves. Some burials may have occurred as early as the ninth century, but the late tenth–early eleventh century is a *terminus post quem*.

Ceramics

Sherd counts and percentages are not accurate indicators of the frequency of ceramic types but in highly disturbed contexts, such as those found at Huaca del Sol, they may provide a rough indicator of culture persistence and change. Four categories were described for decorated pottery at the time of excavation and in subsequent analyses: Moche, Castillo, Chimú and other. Castillo is a serving ware of long duration beginning in early Moche times. ‘Other’ includes Cajamarca, Casma (?), Wari and unidentified styles. Further analysis of the category Chimú suggests that examples of reduced-fired ceramics could also be described as Moche or Lambayeque and are here named Blackwares.

Excavations in unit 1 revealed three levels where Moche sherds were greater in number than any other type (level 1: $n = 199$, 27%; level 2: $n = 250$, 34%; level 3: $n = 75$, 17%). Moche sherds are less numerous in the tombs, where ‘other’ types dominate, but are nonetheless present. The counts and percentages for all Section 4 excavations (unit 1, tombs, pozos/pits and trench) also show a significant representation of Moche sherds (27.3%, compared with 25.9% Blackwares, 0.6% Castillo and 46.2% other; Tufinio *et al.* 2014: fig. 58).

Uhle (1913: 110) states that thousands of whistles and trumpet fragments were discovered, and Tufinio and colleagues (2014: 162) describe 799 sherds of various types of musical instruments found throughout Section 4. These Moche instruments were discovered throughout Huacas de Moche (Scullin & Boyd 2014) providing evidence for the continuance of a Moche burial tradition on Huaca del Sol. Despite disturbance to the upper levels of Section 4, the relative quantity of Moche ceramics suggests that the Moche style was valued by the late inhabitants of Huaca del Sol even if some were only maintained as heirlooms. The same ceramic types have also been found elsewhere at the site. In addition, Uhle found two offering caches: one below the disturbed levels containing Moche-style gold ornaments and the other between an adobe surface and a wall containing early Wari-style ceramics and Moche-style ceramic figurines (Menzel 1977: 39). These finds suggest both Moche continuity as well as Wari influence.

Discussion

Until recently it is likely that no one referred to themselves as Moche; the word has an uncertain meaning in a language spoken north of the Moche Valley and was first documented a millennium after the Moche expired (see Urban 2019: 115–16). Nevertheless, the archaeological culture that we call Moche clearly represents a distinct sociocultural phenomenon and identity for those people who participated in it.

The coastal Moche may have first developed in reaction to the arrival of highland groups (*serranos*), as in evidence by numerous sites with highland-style sherds and house forms in the nearby *chaupiyunga*—the rich agricultural lands of the middle Moche Valley (Billman 2002; Billman *et al.* 2023)—highlanders were always a concern to coastal peoples. At the height of Moche culture, *c.* AD 450–550, highland communities seem to have been rather insular, yet in the Middle Horizon (AD 650–1000), Wari southern highland influences were present at Huacas de Moche, as were coastal Cajamarca style ceramics (cf. Tsai 2019). Evidence from textiles analysed here suggests that other *serranos* also interacted with the Moche.

Hybrid artefacts from late Moche contexts signal adaption to a Middle Horizon world. The continuance of a late Moche presence on Huaca del Sol apparently deterred any Lambayeque intrusion allowing the rise of Chimú in the southern region. The people who lived at Huaca del Sol may no longer have thought of themselves as Moche, *per se*, even though they continued to use symbols and techniques from the past. Just as determining the cultural identity of any prehistoric community is fraught with difficulties, so too is identifying how they came to take on a new one. It appears, however, that the transition between identities, at least on Huaca del Sol, may have been relatively short, and that untangling highland-coastal interactions will continue to underpin our understanding of the Moche.

Conclusions

Our work suggests that a Moche identity was maintained at Huacas de Moche until the end of the tenth century. Textiles found at Huaca del Sol show four distinct styles: one continuing earlier Moche technical and decorative styles; a second employing hybrid Highland-Moche techniques; a third with Moche and Wari influences; and a fourth, Wari style. Together with evidence from ceramics and burial practices, this indicates that the late occupants of Huacas de Moche lived in a world that differed substantially from the experiences of earlier inhabitants. Our research indicates that long-standing Moche material cultural practices and styles continued to be valued at Huacas de Moche, long after the presumed end of the archaeological culture. Textiles were constructed using the same methods as early Moche types and incorporated imagery that continued to express Moche beliefs. In the final centuries of the Moche, new burial traditions were adopted and foreign styles and techniques were mixed with the more traditional styles. Yet some sense of Moche identity appears to have been maintained, even as the world about them changed.

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Online supplementary materials (OSM)

To view supplementary material for this article, please visit <https://doi.org/10.15184/aqy.2024.138> and select the supplementary materials tab.

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