Regional perspectives on Wari state influence in Cusco, Peru (c. AD 600–1000)☆

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A B S T R A C T
The archaeological reconstruction of ancient states requires consistent regional measures of state-directed power and influence. This paper presents data from a series of systematic archaeological surveys in the Cusco region of highland Peru to evaluate patterns of influence by the Wari state during a period of colonization from ca. AD 600–1000. We discuss interpretive debates over the nature and intensity of Wari social power, suggesting that site-based studies can be contextualized meaningfully using our large-scale dataset, which offers settlement patterns at varying distances (0–70 km) from Pikillacta, a Wari administrative center. We discuss local settlement patterns before and during Wari colonization, as well as the distribution of Wari pottery and local Wari-influenced wares. We then use a geographic information systems analysis of travel time from key sites to evaluate the broad regional distribution patterns of local and Wari ceramic styles. Although the regional survey data do not inform us reliably about all kinds of social power, we conclude that the Wari cultural, economic, and political influence over the Cusco region was limited and discontinuous—an example of colonization that resembles the practices of other early states.

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Introduction

How powerful were ancient states? Answering this question depends on how one defines “power” and “the state,” as well as the broader geographic and temporal context within which states operated (e.g., Feinman and Marcus, 1998; Lull and Micó, 2011). Western conceptualizations of the state, including those of neoevolutionary theory, tend to contextualize its power in relative terms—the state is more powerful than those societies that preceded it, as well as those that lie beyond its domain. What makes states more powerful is not just their centralization, but also their internal specialization and proliferation of institutions and offices. An emphasis on institutionalized centralization has implications for modeling the internal organization of states, as well as the external projection of state power and influence (e.g., Flannery, 1972). Internally, the ruling elite of states seeks to monopolize power, so that state institutions under their control replace the power of kin groups, and state power encompasses that of society as a whole. Externally, the state can dominate non-state neighbors, and is only constrained by a culture of isolationism or by the inevitable decay of state power at increasing distances from the capital (Stein, 1999). Such unitary approaches to state power undergird core-periphery models of ancient statecraft, including portrayals of direct and indirect rule.

The internal specialization of states raises questions about the sources and distribution of power across regions that experience state formation and expansion. Rather than thinking of power as a singular social phenomenon that one entity (the state) absorbs and distributes, some (e.g., Glatz, 2009; cf. Mann, 1986) treat social power as originating in multiple sources and being distributed across multiple regional networks—only some of which are developed or managed by state institutions. Centralization and institutionalization are processes that never fully articulate absolute state sovereignty (Hinsley, 1966), promoting conceptual models where the power of the state is irregularly distributed across space and fluctuates over time. Individual actions shape institutional configurations, although within constraints of existing social practices and values (e.g., Giddens, 1984). Treating state power as differentiated and negotiated within a broader regional and chronological context encourages the distinction between whether a manifestation of state power represents the “hard power” of coercive economic or military institutions, or the attractive influence of the “soft power” of the state’s cultural practices or ideological values (Nye, 2004).

Recognizing the cultural legacies of the theoretical stances outlined above, archaeologists face the challenge of testing and improving conceptual models developed from expectations about...
the centralized and specialized power of ancient states. Most frequently, a focus on state power as both centralized and institutionalized seeks material evidence of state institutions with the general expectation that state-affiliated canons reflect direct rule. The distributions of constructions and material culture associated with state cultures—even if they cannot always be unambiguously associated with state institutions or officials—help to chronicle evidence of the state, and researchers continue to identify new examples of these canons. Although excavations in state-affiliated contexts can contribute to understanding how extensively state institutions dominated networks of social power in areas under direct rule, additional data are needed to understand the external limits of the power of the state as it waxed and waned. Focusing solely on the distribution of certain canons associated with a state or the people of its heartland—for example, temples, tombs, and luxury goods—cannot fully distinguish formal and continuous state administration from more ambiguous stylistic distributions or the local adoption or emulation of cultural practices and technologies (Stein, 2002: 907).

Beyond the state capital and administrative centers, state power can be contextualized by critically assessing the distribution of state canons and their association with changes in local settlement patterns and material culture. Distributions of artifacts and architecture can serve to reconstruct regional networks of social power (Smith, 2005), and then to evaluate the extent to which state power or influence may have altered local societies over time. It is important to note that different aspects of state power and influence should not be expected to be continuous or coterminous, and that canons associated with a state society do not always represent state institutions. With sufficient data resolution, regional patterns can identify where states exercised different forms of power and influence, and where local populations resisted or bypassed state institutions, or were largely unaffected by the rise and fall of these large political entities.

Survey archaeology and GIS analysis are well-suited to collect and analyze the regional distributions of state-associated canons, especially durable ones like ceramic styles and architecture. Now conducted across the globe, systematic archaeological surveys can develop robust settlement databases in multiple regions to address general administrative and political goals of the state, as well as how the cultural influence of the state and its people manifests across different domains (e.g., Hingley, 2005; Kantner, 2008; Kowalewski, 2008: 236–237, 242–243; Parker, 2003;Sinopoli, 2006;Smith and Montiel, 2001;Wilkinson, 2000). In this paper, we use regional data to assess the power and influence of the Wari state (ca. AD 600–1000) in the Cusco region of what is today highland Peru (Fig. 1). We present a quantifiable, GIS-derived analysis of the divergent patterns of Wari influence over a broad 2200 km² region that includes hundreds of contemporaneous settlements. Our regional database shows strong, but not absolute, Wari state affiliations in the area directly adjacent to a major Wari administrative center, but much more diffused, discontinuous, and irregular influence across the rest of the Cusco region, with large areas exhibiting limited or no evidence of Wari influence, even at the height of state power in the region.

Archaeological perspectives on the Wari state

The Wari state emerged in the Ayacucho Valley by AD 600, unifying the valley and surrounding areas and enduring until AD 1000–1100 (Bauer and Kellett, 2010; Williams, 2001). Wari’s capital covered 200–300 ha and is associated with several square kilometers of outlying settlement (Isbell, 2008; Schreiber, 1992: 80). The urban core presents evidence of craft specialization, elite compounds, and royal tombs (Benavides, 1991; Isbell et al., 1991). Regional settlement patterns and excavation data from other Ayacucho Valley sites indicate the emergence of a centralized state with a hierarchical settlement system, a political economy based on hydraulic agriculture, and a complex religion and cosmology (e.g., Isbell and Schreiber, 1978). Wari settlers or state representatives began to establish new colonies and administrative sites outside the Ayacucho region sometime after AD 600. The scale, duration, and intensity of Wari colonization varied from region to region—some sites were abandoned before construction was completed, whereas others apparently outlasted the decline of the Wari capital region (e.g., Williams, 2001; Topic and Topic, 2000).

Scholars continue to debate the extent of Wari state power (e.g., Jennings, 2006a, 2010), but the prevailing interpretive model is Katharina Schreiber’s (1992: 267)“mosaic of control,” which presumes the simultaneous practice of direct and indirect administration in different Andean regions. Schreiber (2012: 41) identifies Wari infrastructure—“administrative centers, roads, and the like”—as the material evidence of direct rule. Remains of canonical Wari architecture, especially orthogonal compounds, represent “pockets of direct control” (Schreiber, 1992: 267), although there is no archaeological consensus regarding how large these might be. Reconnaissance work and small surveys have tended to investigate the areas immediately surrounding known or suspected Wari architectural compounds, but systematic regional data rarely extend beyond 10 km from such sites (e.g., Glowacki, 2002; Jennings, 2006b; McEwan, 1984; Schreiber, 2005). Where systematic survey data have been collected at a distance from known or suspected Wari sites, they reveal a highly uneven distribution of Wari canons, with large areas in which they appear to be completely absent (e.g., Bauer et al., 2010; Browne, 1992; Dean, 2005; Heffernan, 1996; Parsons et al., 1997, 2000, 2013; Silva, 1996; Vivanco and Valdez, 1993; Wernke, 2003; Wilson, 1988).

Whereas the mosaic of control model expects direct Wari rule in regions lacking existing local political complexity (Schreiber, 1992: 17–26; Jennings and Craig, 2001), it associast indirect rule with centralized regional authority supported by identifiable infrastructure (Schreiber, 2012: 42). The state architectural canons are absent or of very modest scale in such regions, and archaeologists might encounter “more subtle clues of imperial control such as changes in settlement locations as people were resettled or moved around to serve imperial purposes, shifts in the production and distribution of local crops and resources, and modifications in diet or patterns of violence, which indicate disruptions in daily life caused by the presence of the empire” (Schreiber, 2012: 42). It is important to note that the mosaic of control model posits degrees of control that range from direct to indirect—rather than from absolute state power to complete absence of state influence—which limits the potential to identify archaeological contexts where there was no state rule, or local life changed for reasons unrelated to Wari administrative strategies. Schreiber (1992: 23) notes that there may be areas within the broader territory of a state—some of them located near to state-administered populations—where low populations, limited political hierarchy, or restricted resource potential contribute to an absence of state power. However, few archaeological projects to date have investigated the scope of such areas during the period of Wari expansion.

The mosaic of control model has improved the conceptualization of Wari state power, but the use of different material measures to distinguish direct control (administrative architecture) from other local relationships with Wari institutions and people raises important questions regarding the actual scope of direct rule, the negotiation of indirect rule, and the extent to which Wari power was completely absent in certain areas. To establish an interpretive context for Wari infrastructure in the Cusco region, we analyze the distribution of local and Wari-style pottery in local settlement
systems found along a range of distances from Pikillacta, the largest Wari state installation outside of Wari heartland. In doing so, we consider the extent to which Wari statecraft influenced long-term changes in the settlement hierarchies, ecology, and material culture distribution in the Cusco region.

Wari influence in the Cusco region

The monumental site of Pikillacta dominates reconstructions of the Wari occupation of the Cusco region (e.g., Bauer, 2004; Barreda Murillo, 1973; McEwan, 2005) (Fig. 2). Located in the Lucre Basin roughly 30 km southeast of the city of Cusco, this 47 ha site consists of multiple rectangular enclosures surrounded by a massive outer wall. The site plan and internal architecture conform to Wari state architectural canons and its construction required several million worker-days (McEwan, 2005). Construction continued over at least two centuries, and although this was the largest architectural complex in the south-central Andes at the time, the site was incomplete and only partially occupied when it was abandoned near the end of the first millennium (McEwan, 1996). In addition to the administrative complex at Pikillacta, archaeological research in the nearby Huaro Basin, 15 km southeast of the Lucre Basin, has encountered elite burials (Zapata, 1997), minor administrative architecture (Glowacki, 2002), and a series of Wari residential sites (Skidmore, 2012).

From their investigations in the Lucre-Huaro area, Glowacki and McEwan (2001: 42) conclude that the Wari state imposed direct administration on the region rather than crafting a more indirect administrative strategy using existing local infrastructure. They view Wari imperial control as emanating from the Lucre-Huaro area and extending across most of the Cusco region, completely dominating local populations (McEwan, 2006: 42). This vision has been developed using excavation data recovered within a limited number of Wari state installations or colonial contexts in the Lucre-Huaro area—in other words, work within a Wari “pocket of direct rule” in the sense discussed above. Our survey results, which include the entire occupation sequence of the Lucre Basin and a number of other areas of the Cusco region, offers a broader dataset for evaluating Wari state power in local societies located across a...
broad range of environmental zones and at varying distances from Pikillacta.

Archaeological surveys in the Cusco region

We have completed six survey projects (1984–2007) in the Cusco region (Fig. 3) (Table 1), covering an area of 2200 km², with approximately 3000 registered sites. These projects employed the same basic field methodology: full-coverage survey of all passable areas at intervals of approximately 50 m, with general collections of diagnostic artifacts. The eastern edge of the combined region includes the Lucre Basin, where Pikillacta is located, and borders the Huaro Basin. The western limit, located some 75 km away aerially, is the Vilcaconga Pass leading to the Apurímac River. The north-south axis stretches about 85 km from the well-known Sacred Valley in the north to the province of Paruro in the south. Our regional settlement pattern data are augmented by excavations at more than 20 archaeological sites (e.g., Bauer, 1992, 1999, 2002, 2004; Bauer and Jones, 2003, 2012). Most excavations have been test units to clarify local artifact sequences and enhance the regional chronology, although several horizontal excavations have addressed theoretical questions derived from the settlement patterns (Bélisle, 2011; Covey, 2006; Davis, 2011). These excavations have generated more than 60 radiocarbon dates, linking absolute chronology to relative artifact and architectural sequences.

Ceramic styles and chronology

All research reported here uses Bauer’s (1999, 2002, 2004; Bauer and Jones, 2003, 2012) relative chronology, which is based on ceramic stylistic designations that have been isolated in stratigraphic excavations with absolute dates. We offer a brief description of the most common Cusco styles pertaining to the Early Intermediate Period (i.e. the period preceding Wari colonization, henceforth EIP) and Middle Horizon (i.e. Wari times, henceforth MH) to place survey results into a clearer context. The principal ceramic styles include Qotakalli, Wari, Arahuay, Muyu Orqo, and Ccoipa (Fig. 4). As Table 2 shows, our survey work has identified approximately 550 site components containing one or more of these styles.

As the Wari state developed in the Ayacucho region, the dominant local ceramic style of the Cusco Basin and neighboring areas was a cream-slip ware now called Qotakalli (Barreda Murillo, 1982; Glowacki, 1996; Bauer, 2002). The production of Qotakalli ceramics continued after Wari colonists arrived in the Cusco region, although at a diminished scale of production and distribution in some areas (Bauer and Jones, 2003). The pre-Wari establishment of fine polychrome pottery in the Cusco region corresponds to significant settlement pattern shifts in many areas, which may indicate an increased role of maize agriculture in some local economies (Bauer, 2004: 53; Covey, 2003: 51). Our surveys collected Qotakalli pottery at approximately 250 sites in the Cusco region.

Researchers generally infer direct Wari administration of the Cusco region from the monumental scale of construction at Pikillacta, but some also suggest that the distribution of Wari and Wari-influenced pottery reflects similar dominance (McEwan, 1987, McEwan, 1996; Glowacki, 1996). Because differences between Wari and Wari-related material are sometimes elided to promote arguments for strong state control (e.g., McEwan, 2012: 254–255), it is important to clarify how our research employs these terms. Our survey work consistently restricts the use of the category “Wari” to non-local pottery that conforms to MH decorative canons identified in Ayacucho and at major Wari state installations (e.g., Glowacki, 1996, 2005; Knobloch, 1991; cf. Menzel, 1964). As Owen (2007: 288) notes, many Wari scholars employ stylistic designations based on differences between fine Wari polychrome ceramics bearing state iconography (e.g., Chakipampa, Conchopata, Ocros, Pachacamac, Vilcaque) and categories encomp-

1 Neutron activation analysis (NAA) of selected Wari ceramic sherds recovered in the Cuzco Valley indicates that some were produced in the Wari heartland and then imported into the Cusco region (Montoya et al., 2003). Wari pottery manufactured in the Cusco region has also been identified in small quantities in the Ayacucho region, signaling bidirectional exchanges (Montoya et al., 2009).
passing “less fine variants of the same style” (Huamanga [Waman-ga]). While treated as a style, the assemblage of “less fine” Wari pottery encompasses a broad range of ceramic materials, including “folk” traditions from Ayacucho, lower-status imperial wares from a number of production locations, and hybrid local styles that bear some sort of technological, formal, or stylistic Wari influence. We classify the local Wari-influenced pottery of the Cusco region as Arahuay (below) and argue that the archaeological evidence for its production and distribution does not constitute strong evidence for state aesthetic or economic power. Based on this distinction, we have identified Wari pottery (e.g., Chakipampa, Conchopata, Ocros, Pachacamac, Viñaque) at 54 sites in the Cusco region.

Although the presence of Wari pottery in certain contexts indicates some aspect of Wari economic power, locally produced pottery that incorporates or adapts Wari technology, forms, or iconography offers a more ambiguous marker of Wari influence. Neutron activation analysis by Delgado and colleagues (2007: 410) indicates that “while the Wari may have influenced the production of some local ceramic styles, they did not control local Cusco pottery production or its use.” Our survey projects use the stylistic designation “Arahuay” to refer to Wari-influenced pottery produced in the Cusco region during the Middle Horizon (Bauer, 1999, 2002). Glowacki (1996, 2005) has written that Arahuay pottery resembles the Huamanga ceramics of the Ayacucho region, but as noted above, the broad definition of the Huamanga “style” reflects a perceived divergence from state canons rather than Wari administrative dominion. Compositional analysis has shown that Arahuay ceramics are made from Cusco clays (Montoya et al., 2003).

We have identified Arahuay pottery at 162 sites in our Cusco surveys.

Table 1
Systematic survey projects by authors.

<table>
<thead>
<tr>
<th>Project</th>
<th>Dates</th>
<th>Sites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cusco Valley Archaeological Project (Bauer)</td>
<td>1994, 1997–1999</td>
<td>~1200</td>
<td>~350 km² in Cusco basin and areas to the west and east (Bauer, 2004; Bauer and Covey, 2002)</td>
</tr>
<tr>
<td>Sacred Valley Archaeological Project (Covey and Yépez)</td>
<td>2000</td>
<td>~410</td>
<td>~400 km² in Vilcanota-Urubamba Valley (Calca-San Salvador) and tributary valleys (Covey, 2006)</td>
</tr>
<tr>
<td>Xaquipaquana Plain Archaeological Survey (Covey and Yépez)</td>
<td>2004–2005</td>
<td>~630</td>
<td>~600 km² to west and northwest of Cusco Valley, including survey of high grassland around Lake Qoricocha (Bélisle and Covey, 2010)</td>
</tr>
<tr>
<td>Oropesa-Andahuaylllas Archaeological Survey (Bauer and Araóz Silva)</td>
<td>2006</td>
<td>~170</td>
<td>~100 km² to southeast of Cusco Valley survey, including Lucre basin</td>
</tr>
<tr>
<td>Calca-Yanahuara Archaeological Survey (Covey, Araóz Silva, and Bauer)</td>
<td>2007</td>
<td>~150</td>
<td>~100 km² in Sacred Valley below Calca (Covey et al., 2008). Data combined with SVAP results</td>
</tr>
</tbody>
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Fig. 4. Local EIP/MH ceramic styles from the Cusco region: Qotakalli (top), Arahuay (middle), and Muyu Orqo (bottom).

2 Some fine wares recovered at Pikillacta imitate Okros ceramics of the Wari homeland, but were produced in the Cusco region (Knobloch 1991: 253–254; Glowacki, 1996; Montoya et al., 2003).
Survey research identified sizable components of two other EIP/MH ceramic styles—Muyu Orqo and Ccoipa (Bauer, 1989, 1999, 2004). Both have far more limited distributions than Qotakalli or Arahuay. Muyu Orqo ceramics are decorated with bright white, black, and orange colors painted over a polished, dark red background, which may reflect southerly, Altiplano artistic influences. This style dates to the EIP and the early MH (Bélisle, 2011). While a relatively uncommon ceramic type, it is widespread across parts of the Cusco region, where it has been found at numerous sites in the Xaquixaguana, Cusco Valley, Paruro, and Lucre Basin regions. Ccoipa is a red-and-black-painted style that was produced during the EIP and continued to be used in the MH. Its distribution is mostly limited to the Paruro area, south of Cusco. Our surveys have recovered Muyu Orqo and Ccoipa ceramics in about 50 sites across the Cusco region.

** Settlement patterns in the Cusco and Oropesa Basins**

The Cusco Valley survey recorded approximately 115 sites containing Qotakalli ceramics. The largest site density appears at the western end of the Cusco Basin, around the modern city. Once established, the largest sites were occupied continuously to Inca times. Qotakalli sites were also scattered along the lower valley slopes, concentrated near areas of easily irrigable agricultural land. While most of the sites with Qotakalli ceramics are small, we estimate that at least 14 Qotakalli sites in the basin were villages measuring 1–5 ha. Another village lay just outside of the Cusco Basin, approximately mid-way between Cusco and Pikillacta. Ccoipa pottery appeared at a relatively small number of sites (n = 11), mostly located on the southern edges of the valley, nearest to Paruro. Muyu Orqo ceramics were recovered at 17 sites distributed across the lower slopes of the entire valley. All Muyu Orqo pottery and most Ccoipa components were found in association with Qotakalli pottery.

Our survey recovered Arahuay pottery at 75 sites in the Cusco Valley and 24 sites with Wari pottery. Several important points can be made concerning these sites. First, no general surface collection from the Cusco Valley survey contained more than 10 Wari pottery fragments, even though second visits were made to all EIP/MH sites to determine whether a Wari component was present. The largest Wari collections (7–8 fragments) are small compared to Arahuay components at the same sites, and even smaller when compared to Qotakalli components. Across this study region, Qotakalli sherds were found to be about 20 times more abundant than Wari fragments. Second, no Middle Horizon site in the Cusco Basin is a good candidate for a Wari administrative center. While several 3–4 ha villages have been identified (including the site of Tankarpata, used in the GIS analysis below), no higher order Wari settlements have been found in the Cusco Basin. Perhaps the largest Middle Horizon site in the Cusco Basin was the now-destroyed site of Coripata (Cumpa Palacios, 1988), which may have measured around 5 ha.

Understanding changing settlement patterns in the Cusco Valley study region over time is complicated by the co-occurrence of the Qotakalli, Arahuay, and Wari styles after AD 600. One way to approach settlement continuity is by looking at stylistic co-occurrence at large (one hectare and larger) and small (less than one hectare) sites with Qotakalli and Arahuay pottery (Table 3). Only one large Qotakalli site (of a total of 15 large sites) lacked an Arahuay component, and 73% of these sites contain traces of Wari pottery as well. In contrast, only one large Arahuay site (of a total of 10 large sites) lacked Qotakalli pottery—the exception was a 3 ha village with a small Middle Horizon component and a much larger occupation after AD 1000. Small samples of Wari pottery were collected at 60% of the large Arahuay sites. Of the 100 small Qotakalli sites, 33 have Arahuay components, whereas Wari pottery was recovered at only 13% of these sites. Qotakalli pottery was present at a higher percentage of small Arahuay sites (56%, or 35/63), and small samples of Wari pottery were found at 17% of the small Arahuay sites.

The above figures suggest considerable settlement continuity at village level sites. The apparent discontinuity between small Qotakalli and small Arahuay sites may either indicate that hamlets shifted location over time, or that styles like Arahuay and Wari were simply less likely to reach the smallest settlements. Broad continuities in settlement location and hierarchy suggest that no major settlement reorganization occurred in the Cusco Basin and nearby areas during the period of Wari colonization.

** Settlement patterns in the Lucre Basin**

Our survey data from the Lucre Basin, the area surrounding Pikillacta, reveal stylistic and settlement distributions for populations living in close proximity to the Wari center. Using the same field methods and analytical protocols employed in other parts of the Cusco region, we recorded approximately 25 sites dating to the EIP,
with Qotakalli representing the most common style in the Lucre Basin. Five of these sites (Minaspata, Chokepukio, Mama Colla, Phipipampa, Patawasi) were disproportionately larger than the others, and at least four of these were established prior to the EIP. All five of the largest EIP sites continued to grow through time, remaining as major settlements in subsequent periods. Although most of the largest sites clustered near Lake Huaypar, a substantial part of the population lived in homesteads or hamlets scattered across the surrounding area. In addition to Qotakalli pottery, the Muyu Orqo style was identified at two large sites (Minaspata and Phipipampa), while Ccoipa pottery was found at 7 small sites, primarily in the areas closest to Paruro.

Our survey of the Lucre Basin recovered Wari ceramics from 18 sites and collected Arahuy pottery at 7 sites. Wari pottery was roughly as ubiquitous as Qotakalli in the Lucre Basin, whereas Arahuy was found only in very small amounts. Given that some researchers interpret Arahuy as a Wari style (“Huamanga”), it is significant that Arahuy was identified at only four sites with Wari pottery; this includes excavations at Pikillacta, where Arahuy constitutes 5.5% of the excavated assemblage (Glowacki, 1996). Wari pottery is more prevalent in the Lucre Basin than any other survey region, but Arahuy has a limited distribution there.

Our survey results diverge sharply from McEwan’s (1984, 1991; cf. 2005) interpretation of the Lucre Basin as a unified metropolitan region reorganized and dominated by an urban, Wari population at Pikillacta. Instead, we interpret the nearby villages as ancient and independent communities that continued to be occupied during the period of Wari colonization and long afterwards. It is also worth noting that while the large-scale, Wari-directed canal construction in the Lucre Basin may have altered the local subsistence economy (Valencia Zegarra, 2005), it did not lead to major changes in the overall settlement pattern. Some of the local villages, such as Chokepukio, have evidence of Wari-style architecture, and Wari pottery is much more prevalent, but there is also evidence that many aspects of village life continued from earlier times.

**Settlement patterns in the Xaquixaguana region**

The Xaquixaguana survey identified two distinct clusters of EIP/MH settlements. A settlement hierarchy is identifiable for the southern part of the Xaquixaguana study region, with one large village site, Ak’awillay, covering at least 10 ha (Bélisle, 2011). Of the other 46 EIP/MH sites in this area, about half (n = 25) were smaller than 0.5 ha, while another 21 sites were classified as small villages with a mean size of 1.4 ha. Most sites were situated close to valley-bottom lands. A second area of EIP/MH sites is around Maras, where 32 small sites are scattered across the landscape. These include several minor Arahuy components at sites that were large villages after AD 1000. In general, the northern part of the Xaquixaguana region shows a tapering off of the distribution of EIP/MH styles from the Cusco Basin.

In terms of site counts and overall abundance, Qotakalli pottery is much more common than Arahuy in the Xaquixaguana region (see Bélisle, 2011), and there is far less co-occurrence of the two styles than is seen in the Cusco Basin. This is explained by the more limited distribution of Arahuy pottery and its association with new settlements established around AD 1000. Local imitations of Qotakalli and Arahuy pottery are more common than actual fragments of these styles at many sites. Muyu Orqo ceramics represent a small component at 17 sites in the southern part of the area, where they are strongly associated with Qotakalli pottery. Wari pottery is exceedingly rare in the Xaquixaguana region, recovered in small quantities at only two sites. One of these is Ak’awillay, where a grid of 80 intensive collection units (a total collection area of 4000 m²) recovered a large component of Qotakalli (n = 155), smaller samples of Muyu Orqo (n = 35) and Arahuy (n = 16), and a single Wari fragment. Extensive horizontal excavations at Ak’awillay have confirmed the paucity of Wari material in both domestic and public contexts, and the continuity of local architectural and mortuary traditions during the MH (Bélisle, 2011; Bélisle and Covey, 2010).

The Xaquixaguana survey laid out grids of 50 m² intensive collection units at large sites across the region, permitting a degree of control over the relative quantity and co-occurrence of EIP/MH styles. Of nearly 1000 collection units, EIP and MH styles appeared in more than 100. Only 14 units contained both Qotakalli and Arahuy pottery. More than 70 units yielded Qotakalli pottery (186 fragments), whereas Arahuy appeared in 32 collection units (46 fragments). Muyu Orqo pottery was almost as common as Arahuy, with 39 fragments collected from 24 units. The lone fragment of Wari pottery collected at Ak’awillay represents the only example of this style encountered in intensive collections. The intensive collection data substantiate the conclusion that Qotakalli pottery is found more widely and in greater quantities than Arahuy. Muyu Orqo was well distributed in the region, while Wari was almost completely absent.

**Settlement patterns in the Paruro Region**

As noted above, the Paruro region’s most widely distributed EIP/MH pottery is the locally produced Ccoipa style (Bauer, 1989, 1999: 75–78), found at 35 sites, especially along the Apurímac River and its tributaries. In contrast, Qotakalli ceramics from the Cusco Basin are distributed almost exclusively to the north of the Apurímac River and are rarely the most abundant component collected at a site (Bauer, 1999: 70–75). Ccoipa and Qotakalli are found together at only seven sites. Muyu Orqo pottery was identified at 12 Paruro sites, the majority of which (67%; n = 8) have Ccoipa components. Ccoipa and Qotakalli sites consist of various small villages, hamlets and homesteads scattered across mid-valley elevations. Although settlements varied somewhat in size, they were all relatively small and there is no evidence of a settlement hierarchy.

Middle Horizon settlement in the Paruro region shows less stylistic overlap than has been described for other survey regions, perhaps because of the small size of the sites in question and limited quantity of decorated pottery present on the surface. Wari ceramics were identified at only 9 sites (Bauer, 1999: 63–67), and these are largely confined to areas closest to the Lucre Basin. The distribution of Wari pottery does not correlate strongly with any other EIP or MH styles. Arahuy ceramics were present at just 8 sites concentrated in the northern part of the study region, closest to the Cusco Basin (Bauer, 1999: 67–70). Arahuy pottery is found in association with Qotakalli and Ccoipa components more frequently than with the Wari style, which co-occurs with it at only one site.

Muyu Orqo, a 2500 m² site located on a hillside near Paruro, was the only site in the Paruro study region with a dominant Wari assemblage (Bauer, 1999). Test excavations at the site yielded an unusual assemblage of fancy pottery, limited mostly to drinking vessels and bowls, and quantities of camelid bone suggestive of a non-domestic context. Nevertheless, the Paruro region shows no evidence of Wari-directed settlement pattern shifts or architecture. Furthermore, the production and distribution of the local ceramic style (Ccoipa) appear not to have been affected by Wari activities in the Lucre Basin.

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6 Our survey work did not make surface collections at Pikillacta or Chokepukio—instead, we reference excavation results to identify the presence of EIP and MH styles at these two sites (Glowacki, 2005; McEwan et al., 1995).
Settlement patterns in the Sacred Valley

The Sacred Valley region lacks distinct local EIP and MH styles, indicating instead strong stylistic ties to the Cusco Basin (Covey, 2006). Qotakalli pottery is present at 47 sites, virtually all of which lie between Cusco and the Vilcanota-Urubamba River. Sites registered more than 15 km from the Cusco Basin have significant components of what appear to be local imitations of the Qotakalli and Arahuay styles. Qotakalli sites are usually located in well-watered side valley areas suitable for small-scale agriculture production. Small villages and hamlets are dispersed widely throughout the region, with low levels of population in the Sacred Valley proper.

Because of its close proximity to the Lucre Basin and the site of Pikillacta, the Sacred Valley offers important insights into the nature of Wari imperial influence in the greater Cusco region. A direct Wari administration of the Cusco region might be expected to develop economic power through intensification projects in the famously productive Sacred Valley. Nevertheless, our surveys have documented that the EIP/MH settlement in the valley proper was sparse and that settlements were typically located 200–300 m above the valley floor. Wari pottery was identified at only two sites in the Sacred Valley region, whereas Arahuay ceramics were present at 42 sites, with a distribution largely restricted to areas south of the Vilcanota-Urubamba River. The distribution of Qotakalli and Arahuay ceramics suggests exchange relationships with the Cusco Basin, with a slight tendency toward greater nucleation over time (Covey, 2006).

GIS analysis of stylistic distributions

We have created distribution maps based on how many identified components of a given EIP/MH ceramic style lie within a given walking interval from two important sites, Pikillacta and Tankarpata. Pikillacta was selected for analysis because it is a large Wari installation in the survey region. Tankarpata is a modest sized village site located in the largest known concentration of EIP/MH settlements in the Cusco Basin. We selected it as being representative of villages in the center of the basin. Regional analysis modeled foot travel across the survey area, assuming that travelers are aware of the terrain configuration and avoid barriers, such as crossing waterways that could potentially slow down the trip. This terrain analysis uses Tobler’s algorithm to calculate an anisotropic surface depicting the difficulty of passing through an undulating landscape while accounting for terrain slope as its cost surface (Tobler, 1993). Tobler’s original function is:

\[
\text{Speed} = 5.037 \text{ km/h} - \frac{3.5}{1000} \text{ km} \times \text{slope} + 0.05
\]

To calculate travel time estimates and produce isolines of same-time routes, the above function translates into the inverse of the slope/speed relationship:

\[
\text{Travel Time} = \left( \frac{1}{6000} \right) \times e^{3.5 \text{ km} \times \text{slope} + 0.05}
\]

Data from the Instituto Geográfico Nacional del Perú provided different digital contour datasets at 1:100,000 scale that were combined together and clipped to the limits of the survey area. Geographic Information Systems software ArcGIS 9.2 aided in merging the geographic datasets and the analysis of survey data. The path distance surface is a heuristic means of representing the anisotropic movement in terms of units of time, and served as the basis for the creation of isolines every three hours’ distance from Pikillacta and Tankarpata. The most distant components from each site were between 15 and 18 hours travel time (Tables 4 and 5, respectively).

7 As in the Xaquixaguana study region, Arahuay pottery occurs at some Sacred Valley sites with a prominent LIP occupation, suggesting a regional settlement balkanization beginning before AD 1000.

8 This formula assumes that on a downward sloping surface the walker will advance faster than when walking an upward slope. For flat surface or zero degree slope, Tobler’s function computes speed of 5.037 km/h. The greatest speed according to this function would be for a walker to cover 1 km of about 3 degree downward slope at 9.6 min.

9 The path distance surface was calculated with Tobler’s walking time formula by supplying the function with a customized text file (Vertical Factor) that contained degree slope values in the first column and the corresponding value from Tobler’s formula in the second column.

Table 4

<table>
<thead>
<tr>
<th>Travel hours from Pikillacta</th>
<th>Qotakalli</th>
<th>Arahuay</th>
<th>Wari</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 3 hrs</td>
<td>58</td>
<td>21</td>
<td>27</td>
</tr>
<tr>
<td>3–6 hrs</td>
<td>41</td>
<td>31</td>
<td>9</td>
</tr>
<tr>
<td>6–9 hrs</td>
<td>71</td>
<td>63</td>
<td>12</td>
</tr>
<tr>
<td>9–12 hrs</td>
<td>44</td>
<td>29</td>
<td>3</td>
</tr>
<tr>
<td>12–15 hrs</td>
<td>23</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>15–18 hrs</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>238</td>
<td>162</td>
<td>54</td>
</tr>
</tbody>
</table>

Table 5

<table>
<thead>
<tr>
<th>Travel hours from Tankarpata</th>
<th>Qotakalli</th>
<th>Arahuay</th>
<th>Wari</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 3 hrs</td>
<td>95</td>
<td>63</td>
<td>18</td>
</tr>
<tr>
<td>3–6 hrs</td>
<td>83</td>
<td>57</td>
<td>21</td>
</tr>
<tr>
<td>6–9 hrs</td>
<td>54</td>
<td>35</td>
<td>12</td>
</tr>
<tr>
<td>9–12 hrs</td>
<td>5</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>12–15 hrs</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>15–18 hrs</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>238</td>
<td>162</td>
<td>54</td>
</tr>
</tbody>
</table>
The results of the GIS analysis reveal some important patterns in the distribution of Qotakalli, Arahuay, and Wari pottery as a function of distance from key sites (Fig. 5). At the outset, it is important to recognize that the locations of Pikillacta and Tankarpata in relation to the survey regions influence how much of the area within a given walking interval has been systematically investigated. Our data offer a very strong portrait of the region within 9 hours of Tankarpata, whereas the same region represents a smaller sample of the area within six hours of Pikillacta, since that site is at the southeast margin of our region. Based on nearby regional studies (e.g., Glowacki, 2002; Kendall, 1994: 63; Kosiba, 2010: 318), we expect that additional Wari components should be encountered within about 6 hours or so of Pikillacta, especially in easterly directions in areas farther from the Cusco Basin than those analyzed in this article (e.g., along routes to Ocongate, Quiquijana, and Pomacanchi).

The distribution of Qotakalli pottery (Fig. 6) supports earlier studies (Bauer, 1999; Montoya et al., 2003) that identify the Cusco Basin as the center of production and distribution of this ceramic style. Qotakalli ceramics appear throughout the modest settlement hierarchies of the basin and its immediate surroundings, with most examples recovered in valley-bottom villages and hamlets within a day’s round-trip walk of Tankarpata. Pikillacta lies at the margin of this distribution limit and produces a travel-based distribution that makes it unlikely that the site was a major distributor of Qotakalli pottery. The large Xaquixaguana village at Ak’awillay lies at roughly the same distance from Tankarpata, in the opposite direction. Qotakalli ceramics appear at sites that are more than a day’s walk distance from Tankarpata, but locally produced pottery seems to be more common at distant EIP/MH sites, including the Ccoipa style and local imitations of Qotakalli. This distribution pattern supports the interpretation that a single Cusco Basin polity did not establish formal hierarchical control over the greater Cusco region, and that the power of local elites did not extend much beyond regular face-to-face contacts.

The distribution of Wari pottery (Fig. 7) is also limited in terms of site components, sherd counts, and geographical scope. With the notable exception of Pikillacta, Wari pottery does not appear in the context of new settlement locations or a more pronounced regional hierarchy that would suggest a network of imperial administrative sites. Wari ceramics are largely restricted to village sites and are rare at small sites. Almost all Wari site components are found within a day’s round-trip walk of Pikillacta. Not surprisingly, there is greater distribution along the axis of valley-bottom settlements that run from the Lucre Basin to the Cusco Basin. Some of this pottery could have been distributed through direct exchanges between Wari colonists and locals, or through down-the-line trading. The regional distribution of Wari pottery supports the interpretation that the style was used by Wari colonists and exchanged with their neighbors, but was not something that was associated with state-directed changes to the everyday life of most people living in the Cusco region during the MH.

The distribution of the Arahuay style (Fig. 8) offers a more subtle portrait of Wari influence, and it may help to clarify some of the interpretive controversies surrounding the Wari occupation of the Cusco region. Arahuay is uncommon within about 3 hours’ walk of Pikillacta, where it is negatively correlated with the distribution of Wari pottery. Rather than being a local Wari style emanating out of the Lucre-Huaro area, Arahuay appears to be a local Cusco Basin style that has nearly the same geographic scope as Qotakalli, but in smaller amounts and a more limited presence in lower-order settlements. The distribution of Arahuay does not correspond to
regional changes in settlement location or hierarchy, nor does it indicate different exchange patterns that would spread the style beyond the bounds described for Qotakalli pottery. Although a Wari decorative influence has been noted on Arahuay pottery, settlement and distribution patterns suggest that this “soft power” was not accompanied by significant changes to local social organization or economic exchange systems (Bauer and Jones, 2003: 14).

Discussion

The synthesis of EIP and MH settlement patterns across our combined study regions offers insights into pre-Wari settlement patterns and the degree of transformation that followed the colonization of the Huaru-Lucre area around AD 600. Wari colonization targeted areas with small local populations, where major investments had to be made to establish productive farmland and sources of water. There is no evidence of state administrative centers in areas with modest settlement hierarchies, such as the Cusco Basin or Xaquixaguana Valley, which are the expected locations for establishing direct rule. These areas also lack the kind of evidence of indirect rule predicted by the mosaic of control model—small imperial installations, settlement pattern shifts, and evidence of changes in subsistence priorities. Overall, the survey data suggest that the pocket of direct rule established by the Wari state in the Cusco region was surprisingly small, whereas much of the region lacks convincing evidence for even indirect state rule.

Our theoretical approach emphasizes diverse forms of power many of which do not necessarily flow from state facilities, so it is important to consider our regional data in terms of how they might reflect dynamic networks of social power. Given that standing architecture and other material remains are not uniformly distributed across the region, our discussion limits itself to ceramic distributions, acknowledging that these data do not reflect all kinds of social power potentially wielded by local populations or Wari colonists and state officials.

Everyday social practices

Local settlement pattern continuity suggests minimal alterations to subsistence practices during the MH. Importantly, the persistence of multiple local ceramic styles from the EIP into the MH indicates that local material culture continued to be produced, exchanged, and consumed during the Wari occupation. In other words, the diffusion of Wari social influence did not reach all populations of the region or all levels of local social hierarchies. Nevertheless, it is also apparent that the presence of Wari populations in the Lucre Basin had sufficient cultural influence that some local potters adopted Wari stylistic elements in their production of the Arahuay style.

Religion

Survey data generally do not provide representative regional perspectives on religious change, but a few site-based observations hint at the existence of Wari patronage and influence in certain locations. Bauer’s (1999) test excavations at Muyu Roqo in the Paruro region suggest Wari involvement in a local festival event, although such patronage is not evident at other sacred locales. Furthermore, excavations at the local EIP/MH center at Ak’awillay reveal continuity of local ritual practices with little evidence of Wari state influence (Bélisle, 2011; Bélisle and Covey, 2010). In contrast,
the burial remains recovered by Glowacki (2002) in the Huaro area provide notable examples of Wari ritual paraphernalia and iconography (cf. Zapata, 1997). Clearly, additional excavation work is needed throughout the region to gauge the nature and extent of Wari religious influence.

Economy

Local populations throughout the Cusco region already practiced valley-bottom agriculture, including the cultivation of maize, before Wari colonization. Wari settlers may have organized the construction of the impressive Lucre Basin canal and terrace system (Valencia Zegarra, 2005), but otherwise our survey data do not indicate significant intensification projects or economically-oriented settlement shifts. More excavations and geochemical analyses are needed to approach questions of craft production and long-distance exchange relationships, but it is worth noting that the distribution of Wari pottery is generally restricted to the areas closest to large Wari sites, whereas the ceramic components found farther away suggest exchange patterns among different parts of the Cusco region. It is also important to note that about 10% of the pottery analyzed by Glowacki (1996) at Pikillacta was identified as Arahuay (5.5%) or Qotakalli (4.5%), indicating that economic influence was not strictly unidirectional.

Military

Pikillacta was built with high perimeter walls and controlled access patterns, but no other contemporaneous sites of the region possess defensive features, and very few EIP or MH sites are found in what might be considered defensive locations. There are also no clear settlement shifts between EIP and MH patterns that suggest the abandonment of undefended villages and productive farmland—a shift that is clearly in evidence in many parts of the Cusco region after AD 1000 and has been interpreted as an increase in regional hostilities (Bauer and Covey, 2002). These patterns suggest that Wari colonization did not take place under regional conditions of large-scale intergroup conflict.

Politics

Wari political influence is obvious in the Huaro-Lucre area, and the scale of construction and adherence to Wari canons marks Pikillacta as an unprecedented state project in the south-central Andes. Construction techniques and the huge labor requirements needed to carry out such a project suggest that multiple work groups labored at Pikillacta during construction episodes that occurred over several generations (Bauer, 2004: 61–62; McEwan, 2005: 63–83). It seems reasonable to infer that Pikillacta’s construction reflects a Wari state strategy to govern local populations directly, an attempt to refashion an outlying colony into a state-administered region. Despite the political ambitions communicated by the great enclosures at Pikillacta, construction was abandoned in the midst of the project, and only a small part of the site was ever occupied (McEwan, 2005).

Settlement patterns beyond the Lucre Basin area also reflect the incomplete realization of state dominance. The Cusco Basin shows evidence of closer contact with the Wari centers in Lucre and Huaro than other parts of the region, although survey data suggest that it lacked a Wari administrative center, or even the emergence

![Diagram](image_url)
of a more hierarchical regional settlement pattern. Other parts of the Cusco region exhibit similar continuity of existing patterns of settlement hierarchy (or lack thereof) over time, with no clear indication of Wari state administration.

Overall, the patterns of Wari power and influence indicate that while populations living in the vicinity of the Wari sites in the Huaroc-Lucre area experienced extensive changes, state influence was variable and limited throughout most of the Cusco region. Nearby areas of greater population density, social complexity, or specific resources appear to have had closer interactions with the Wari colonies, and it may be that higher status individuals in these places were in more contact with and influenced by Wari culture. However, large areas lying at a distance from the Wari colonies and localities with low populations levels do not exhibit evidence of Wari influence. In short, the regional settlement picture indicates a significant difference between Wari state policies (reflected in the investment in construction at Pikillacta) and actual region-wide state power.

Fig. 9. Schematic map of Wari state influence, emphasizing the discontinuous nature of state social power. Note that not all “Wari” architecture has been confirmed archaeologically.

Conclusions

Our results lead us to several significant conclusions regarding colonization and the regional expression of different kinds of state power and influence. Wari interactions with local populations in Cusco were very limited beyond a few hours' walk from key settlements or state installations. The data suggest an archipelago of colonies and strategic installations, with restricted areas displaying high fidelity to Wari canons surrounded by regions with little or no evidence of Wari influence (Fig. 9). Such a viewpoint is consistent with settlement patterns in other regions of the Andes. For example, surveys in the Moquegua region indicate intensive Wari colonization in the vicinity of Cerro Baúl, where new large-scale hydraulic works were built (McEwan and Williams, 2012), with limited distribution of Wari architecture or pottery at sites more than a few kilometers away (Goldstein, 2005; Owen, 1996; Owen and Goldstein, 2001; Stanish, 1985). The scale of our study region helps to illustrate why small surveys conducted around confirmed or suspected Wari installations often identify Wari influence,
whereas surveys around non-Wari centers often fail to encounter such evidence (cf. Jennings, 2002, 2006b; Doutriaux, 2004: 212–220; Scisciento, 1989; Wernke, 2003). Regional surveys in the Nasca region and nearby south coast valleys present a comparable disjunction between directly occupied Wari locales and areas with no apparent Wari influence (Browne and Baraybar, 1988; Edwards, 2010; Proulx, 2007; Schreiber, 1999; Schreiber and Lancho Rojas, 1995; Silverman, 2002; for survey data from nearby valleys, see Canziani, 1992; Menzel and Riddell, 1986).

The regional data expose problems in interpreting macro-regional distribution patterns of Wari architecture, ceramics, and other material culture. As art historians move to describe Wari craft goods formally (e.g., Bergh and Jennings, 2012), it is important to draw the distinction between regional archaeological data and the interpretive potential of museum objects. Looted tombs—especially those of the coastal desert—demonstrate the elite consumption of fine Wari-style craft goods, but it is problematic to infer direct state administration from poorly-provenanced objects with no other cultural context. The spectacular mortuary remains recently reported in the Vilcabamba region represent a rare instance where high status Wari mortuary offerings have been excavated and affiliated with state architectural and burial canons (Fonseca Santa Cruz and Bauer, in press), although the regional expression of state power and influence remains to be determined.

Without a systematic regional context, it is problematic to assume that the conditions at or immediately near a state settlement, architectural compound, or tomb are representative of the entire region. Furthermore, the identification of portable objects in a state-affiliated style—ceramic vessels, textiles, and other craft goods—should be considered as evidence of interregional exchange networks only, unless clear indicators of state domination are evident. This is particularly true for mortuary assemblages and museum pieces that lack a clear excavation context. In a similar vein, it is important to acknowledge that continuous imperial domination is not needed for portable goods to be moved across great distances, and when objects change hands their use and significance can also be reinterpreted. Technology and iconography can be diffused in even more complicated ways.

The regional scope and intensity of the Wari occupation of Cusco encourages comparisons with the footprint of early states in other world regions—Uruk, Old Kingdom Egypt, Monte Albán, Teotihuacan, Tiwanaku—where colonies or enclaves met economic demands and fulfilled civic and strategic functions for centuries as the state developed the motivation and means for creating institutions and practices brought from the Ayacucho region. Such an observation encourages archaeologists to reconsider the role of colonies as a civic outgrowth that might or might not lead to the creation of institutions for the direct and formal administration of peripheral regions (e.g., Stein, 2005), and it underscores the limits of state power across space and time, despite the messages inscribed on state monuments and in official histories.

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References


11 This figure is heavily weighted by large size estimates for Cusco Wari sites (47 ha for Pikillacta and 150 ha for Huaro [Glowacki and Zapata, 1998; McEwan, 2005]). It also includes the incomplete site of Viracochapampa (32 ha), disputed sites such as Achach sawa (35 ha—see Doutriaux, 2004), and unconfirmed sites identified using air photos, such as Pariarcarca and Tocroc. See Jennings (2006a: 269–270) for discussion of assumed lower-order Wari sites.