CONTINUITIES AND DISJUNCTURES IN URBAN PLANNING IN THE ANCIENT ANDES

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A comparative analysis of prehispanic Andean cities indicates significant discontinuities in the organization of public space. Although architectonic components and architectural inventories recur in different urban traditions, there are marked differences in the overall plans of Andean cities and little continuity between the earliest Andean urban centers and earlier Formative settlements or between later capitals and cities associated with various Andean states and empires, such as Moche, Tiwanaku, Wari, Chan Chan or Cuszco. This suggests that the prehispanic Andean city was developed divergently and employed different principles of urban design, and that Andean societies deployed different forms of what Eric Wolf called “structural power,” in which the urban landscapes were the settings for different forms of power interactions through Andean prehistory.

The Central Andes have an urban tradition that is among the oldest known in the world (Figure 1). With the appearance of large settlements during the 3rd – 2nd millennia B.C. along the Peruvian coast, a constructed legacy began that rivals ancient Mesopotamian cities and antedates by at least a millennium the development of Mesoamerican urbanism (Makowski 2008). Yet, a diachronic perspective suggests that prehistoric urbanism was a fragile and inconstant process in the Andes, as prehistoric communities aggregated and dispersed, presumably in response to a range of social and environmental pressures. Unlike other regions of the ancient world where basic urban forms were created and recreated over centuries, a comparative analysis of Andean urbanism suggests that settlement forms were devised and employed but then discarded. Since the buildings or their ruins largely remained visible on the Andean landscape, it is unlikely that these different urban forms were unknown by later communities. Rather, earlier settlement forms apparently were rejected or ignored by later Andean societies. Documenting these continuities and discontinuities in Andean urban settlements is the principal object of this chapter.

The following discussion adopts a "top-down" perspective, as defined by Fisher and Creekmore in the Introduction, not because that is the only relevant point of inquiry but because it provides a vantage point for examining diachronic variations in Andean urban plans. In turn, this chapter presents one aspect of an ongoing project regarding urbanism and the built environment in the prehispanic Andes (e.g., Moore 1996a, 2005a), which is based on a set of readily summarized concepts. Following Rapoport (1990), I consider all components of the built environment—from individual structures to entire cityscapes—to reflect multiple decision domains, a position I have discussed elsewhere (Moore 2005a:3-5, 2012:3-5). Further, I contend that elements of the built environment are "simultaneously constitutive and reflective," as

Preziosi and Hitchcock (1999:25) noted, “as much instruments that function to fabricate and maintain social realities as themselves products of ongoing and dynamically changing realities.” Architecture and the built environment are created by humans, and, in turn, mold subsequent human action (Pearson and Richard 1994). “The relationship between space and society is reflexive and mutually determining,” Fairclough has observed (1992:348-349), and architecture and the built environment “can also illustrate social change over the long term more effectively than other types of artefact.”

A robust body of archaeological theory links power and the built environment (e.g., Abrams 1989, 1994, 1998; Ashmore and Knapp 1999; Bradley 1998; DeMarrais et al. 1996; Hillier and Hanson 1984; Lawrence and Low 1990; Low 2000; Moore 1992, 1996a, 1996b, 2004, 2005a, 2005b; Pearson and Richards 1994; Rapoport 1969, 1982, 1990). Eric Wolf’s concept of *structural power* is particularly relevant to such inquiries (Wolf 1982, 1999, 2001; see Moore 2005b for further discussion.) One of four modes of power discussed by Wolf, structural power refers to “the power manifest in relationships that not only operates within settings and domains but also organizes and orchestrates the settings themselves, and that specifies the direction and distribution of energy flows” (Wolf 1999:5). Structural power is deployed in two directions; it has empirical effects in the real world—mobilizing social labor, controlling resources—and it is engaged in the world of symbols and ideas. Allocation and connotation are intertwined. “The ability to define what things are,” Wolf wrote, “is also the ability to define what things are to be had by whom, how, when, and where, with whom and against whom, and for what reasons” (Wolf 2001:375). Structural power always has this “double nature” (Wolf 2001:375). A diachronic examination of urban plans contributes to understanding variations in structural power in ancient Andean societies.

Before proceeding further, it is important to define "urban center." If one were to apply V. Gordon Childe's (1950:11) definition of urban as having cities with minimum populations of 7,000 – 20,000 residents, few Andean settlements would be classified as urban. Based on current archaeological data, no Andean sites were as populous as the Classic and Post-Classic cities of central Mexico (Cowgill 2004; Smith 2007). For example, Morris and colleagues (2011:21) note that at 16th century Spanish eyewitness only designated a few Andean settlements as "cities"—such as Cusco and a few other settlements—rather "referring to most communities of several thousand as towns (pueblos)." Few Andean settlements had more than 25,000 – 40,000 residents, and only Inca Cusco may have had 80,000 -125,000 residents in its "metropolitan area" (Hyslop 1990:64-65). This has led some archaeologists to argue that cities were small, late, and rare in the Andes (Stanish 2001:53, 2010:199-205; Kolata 1983). As Makowski (2008) has recently discussed, profound disagreements and spirited debates exist about the urban nature of Andean settlements (e.g., Rowe 1963, 1967; Schaedel 1966, 1978.)

In many large prehistoric Andean sites, there has been a lack of archaeological investigations in residential zones, making population estimates difficult especially when domestic architecture is poorly preserved or invisible because of the expansion of modern agriculture or cities over the sites. Further, Andean urban centers commonly drew on a larger and dispersed rural population, often living within a radius of 5 – 10 km, in addition to residents at the center itself. Rather than a population living within a walled city, such as in ancient Mesopotamia, Han China, ancient or medieval Mediterranean city-states (cf. Creekmore, Fitzsimons, Nishimura, and Razeto, this volume) Andean urban centers often served a spatially dispersed population unenclosed by city walls, similar to Mayan and other Mesoamerican cities (cf. Mangoni et al, and Stark, this volume). This settlement pattern can be seen at various points

in Andean prehistory, in such unrelated archaeological traditions as Initial Period sites (S. Pozorski and T. Pozorski 2008) and Tiwanaku (Albarracin-Jorban 1996). As John Murra (1975) argued, the lack of settlement aggregation may be a strategic adaptation to Andean environmental diversity in that populations attempt to gain access to multiple resource zones. During the Colonial Period, this Andean settlement pattern was characterized as "salpicado" or "sprinkled," a situation remedied—in the Spanish viewpoint—by the process of *reducciones* or forced resettlement of native population into specific communities.

For these reasons, a definition of urbanism needs to be applied to the Andes that is broader than simple population aggregation. Bruce Trigger argued (2003:120) "The key defining feature of an urban centre is that it performs specialized functions in relation to a broader hinterland" including administrative, economic, and religious functions. In a similar vein, Michael Smith (2007: 4-5) employs:

> a functional definition of *urbanism*: urban settlements are centers whose activities and institutions—whether economic, administrative, or religious—affect a larger hinterland. Cities are large urban centers with numerous urban functions, whereas towns are smaller urban centers with fewer urban functions. This functional definition allows the classification of a wider range of nonwestern settlements as *urban* than does the more common demographic definition of urban settlements as large, dense, socially heterogeneous settlements.

Rather than only focus on settlements with more than 7,000 – 20,000 residents, I will examine a broad cross-section of Andean sites based on their "specialized functions" (see Cowgill 2004; Smith 2009; Stanish 2001).

The balance of this chapter summarizes the basic patterns of Andean urbanism between circa 3000 BC and AD 1500, geographically focusing on the coastal and highland regions of the Central Andes of Peru and Bolivia. This geographic focus is based on the relative absence of major urban centers in the Northern and Southern Andes, where other settlement patterns

characterize the periods preceding the expansion of the Inca Empire that introduced and imposed specific urban forms as one element of territorial conquest and political incorporation (Bauer 2004; Hyslop 1990.) Also, I will not discuss the distinctive patterns of settlements that have been recently discovered in Amazonia (Erickson 2000, 2001; Roosevelt 1999; Salazar 2008), including those Heckenberger and colleagues (2007, 2008) have characterized as "dispersed, multi-centric urbanism."

In order to structure the comparison of Andean urban plans, I will apply a set of qualitative variables discussed by Michael Smith (2007) in his article "Form and Meaning in the Earliest Cities." Drawing on the ideas of Amos Rapoport, Kevin Lynch, Spiro Kostof and others, Smith employs variables relating to two dimensions of settlement form: 1) coordination of building and spaces and 2) standardization between settlements. After discussing these dimensions and defining the qualitative variables associated with them, I will apply them to a sample of Andean urban centers. This comparative analysis illustrates the significant disjunctures in Andean urban forms throughout prehistory.

Coordination and Standardization in Urban Planning

Michael Smith (2007) has outlined a series of qualitative traits useful for the comparative analysis of ancient urban patterns, an analytical advance beyond the simple dichotomy between "planned" and "unplanned" cities. These qualitative traits fall into two domains: 1) coordination of building and spaces and 2) standardization between cities. Smith writes:

> My approach to urban planning in the earliest cities has two components….The first component, coordination among the buildings and spaces in a city, is based on Carter's definition of planning. I describe this phenomenon under five headings: the arrangement of buildings, formality and monumentality of layout, orthogonality, other forms of geometric order, and access and visibility. My second component is standardization

> among cities, based on Ellis's definition. I discuss standardization in terms of urban architectural inventories, spatial layouts, orientation, and metrology (2007:7).

In this, Smith alludes to the ideas of Harold Carter, in which "planned cities are those in which 'there is a discernible and formal organization of space'" and to the comments by Simon Ellis, "By 'planned' I do not mean those [cities] that were pre-meditated, but rather those whose urban design was made to follow a specific regular urban design" (quoted in Smith 2007: 6-7).

Smith envisions the variable of co-ordination as in reference to an ordinal scale of planning: 1) co-ordination, 2) formality, 3) monumentality, 4) orthogonal and 5) diagrammatic plans. The scale value of *coordination* "describes cases in which architectural features appear to have been arranged and constructed with reference to one another," citing as an example common orientation and specifically excluding topographic factors (e.g., riverbanks or shorelines) that might naturally create the appearance of co-ordination. *Formality*, according to Smith (2007:9) is present when "organizational principles are clear to observers or participants", citing examples of planning principles in ancient Chinese capitals and plaza groups in Mesoamerican settlements. In turn, formality is often combined with *monumentality* which, following Bruce Trigger (1990), Smith (2007:11) defines "as buildings that are much larger than they need to be for utilitarian purposes." *Orthogonal plans* are basic grid patterns, such as those common to the Greek and Roman urban traditions (Rykwert 1976), that Smith further sub-classifies into a) semiorthogonal, b) integrated orthogonal, and c) modular orthogonal plans, and Smith illustrates these distinctions with plans from Çatal Höyük, Mohenjo-Daro and Teotihuacán. Smith also discusses other non-orthogonal, *diagrammatic* urban plans that would indicate high levels of co-ordination, such as circular ceremonial-residential zones in prehispanic west Mexico. Smith observes that such diagrammatic forms of geometric order in the ancient world "are much rarer, however," in the process over-looking the radial plan commonly present

in Inca provincial centers (Hyslop 1990:202-215). Although Smith (2007:7) describes these variations in co-ordination as a "series of ordinal scales," in fact there is only a rough progression from "less-coordinated" to "more-coordinated." Rather, his scheme points to some of the variations in urban planning, and is an advance over a simple "planned vs. unplanned" distinction.[1]

Distinct from co-ordination is the dimension of *standardization,* i.e., the degree to which a particular urban form is replicated among urban centers of a given cultural tradition or polity. Smith discusses some of the problems with evaluating standardization, writing that this "aspect of urban planning presents more obstacles to archaeologists than the coordination among buildings" including issues of sample size, the measurement of similarity, and other concerns. Smith suggests looking at three aspects of standardization. *Architectural inventories* refer to the presence of a common suite of constructions, such as temple-pyramids, rectangular plazas, ball courts, and causeways in Classic Maya cities. *Spatial patterns* refer to commonalities in the placement of constructions within the urban plan, such as the placement of agora, temples and forums in the center of Roman cities or the standard ordering of the walled Yoruba city as pivoting on the central royal palace with an adjacent market, and residential sectors organized as lineage-based neighborhoods (Smith 2007:27-28). Finally, Smith suggests that two additional measures of standardization would be *orientation*—literally patterns of alignment based on astronomical features or other concepts—and *metrology*—the application of standard units of measurement or the parallels between the numbers of building units and cosmological principles. As Smith suggests there are challenges in applying standardization to an entire architectural

[1] Smith (2007:23-25) also discusses the variables of access and visibility, variables that I have explored previously (Moore 1992, 1996). These variables, however, require accurate and detailed plans of buildings before they can be assessed; such plans are not available for many of the sites I am discussing in this article, and therefore I will not consider access and visibility further.

tradition, so I will apply a simple—and probably simplistic—distinction between "standardized," "non-standardized" and "mixed" urban forms.

As noted above, Smith devised this approach to escape the simple dichotomy between "planned" vs. "unplanned" settlements; his is a more nuanced approach to the organization of ancient urban centers. My objective is slightly different: I want to identify the continuities and discontinuities within Andean urban traditions, to see whether various Andean societies either replicated previous settlement patterns or developed new forms. As noted above, my interest in the examination of such variations is stimulated by a broader concern with power and social order in ancient Andean societies (Moore 1996a, 2005a). There are several reasons to contend that variations in urban form are, in part, reflections of differences in the magnitude and exercise of power. First, although not all settlement patterns are the products of centralized authority, one expects that "more planned" settlements—such as orthogonal or diagrammatic plans—may indicate the visions of central authority (cf. Buell, and Fisher, this volume). Second, the construction of monumental buildings suggests the diversion of labor from narrowly focused domestic goals, even when such diversions are episodic or short-lived. Third, the investment of labor in different elements in the built environment may indicate the various priorities given to distinct projects, whether city walls, palaces, fortresses, or temple complexes. And finally, standardization of architectural inventories and spatial patterns may suggest different sets of power relations: 1) when standardization occurs synchronically, then this may indicate the imposition or adoption of a shared ideology among communities, and 2) when standardization occurs diachronically it may reflect a claim for political validity rooted in historical continuities.

This said, an overview of Andean urbanism points to a pattern that is stunning in its diversity and lack of historical continuities. While the relationships between power and

architecture are obviously complex, a diachronic survey of Andean settlement patterns suggests that there were broad recalibrations of power relationships that are partly reflected in dramatically diverse urban patterns. It is notable that although Smith (2007) cites a broad array of urban traditions to illustrate various patterns of coordination and standardization, *he could have illustrated all those permutations citing only examples from the prehispanic Andes*—there is simply that much variation in patterns of Andean urbanism.

Patterns of Andean Urbanism: A Synoptic Overview

During the 3rd – 2nd millennia BC, archaeological sites with remarkably complex monumental architecture developed along the central coast of Peru, a burst of urban development then unparalleled in the Americas (Moseley 2001; Williams 1985). One of the earliest known cases is located in the Supe Valley, Peru, at the site of Aspero, which contains seven artificial mounds, plazas, terraces and midden deposits over an area of approximately twelve hectares (Feldman 1985, 1987). The artificial mounds are one to four meters tall, the products of repeated episodes of construction, fill, and reconstruction. Successive sets of interconnected rooms were built from fieldstone, plastered with mud occasionally painted red or yellow, and intentionally buried and rebuilt. As Feldman (1985:76) notes, "These rebuildings do not appear to have been motivated by disrepair of the old level," and instead seem to be an example of the ritual entombment of sacred architecture. Excavations in two major mounds (Huaca de los Sacrificios, Huaca de los Idolos) recovered radiocarbon samples from the upper construction levels with mid-points dating to between 3029 and 2460 cal BC. Feldman suggests that construction began several centuries earlier at Aspero.

Preliminary data suggests that Aspero was not an anomaly, but one example of a broad wave of mound construction on the central coast of Peru. For example, Haas, Creamer and colleagues (Haas and Cremer 2006; Haas et al. 2004; Creamer et al. 2007) have published radiocarbon dates from thirteen sites in the nearby Pativilca and Fortaleza valleys, with large and multiple platform mounds being constructed between 2500 – 2000 cal BC.

If Aspero was an early experiment in the development of Andean monumental architecture, the site of Caral was a full-blown realization (Figure 2). Also located in the Supe Valley, Caral extended over 66 ha, and radiocarbon samples from architectural contexts date Caral's development to 2627 - 1970 cal BC. (Shady 2006:60-61). The site contained residential areas and 32 public structures, including six large mounds surrounding a plaza (Shady et al. 2001; Shady and Leyva 2003). The six large mounds range from one 60 X 45 m at its base and 10 m tall to the massive Great Temple, measuring 170.8 X 149.7 m and 29.9 m in maximum height. Shady interprets Caral as the major node in a network of 18 sites, arguing that the concentration of some 200,000 m^3 of monumental architecture at Caral indicates its preeminent role in the region. In addition, Caral was a pivotal center within local and long-distance exchange networks, and was occupied by different status groups, although the number of residents is uncertain. Based on such evidence, Shady argues that the residents of the Supe Valley "constructed the first planned cities in the New World" (2006:62).

The development of major centers first seen at Caral and neighboring sites became widespread during the Initial Period of 2100 – 1000 cal BC, a "dynamic time of remarkable cultural achievements" (S. Pozorski and T. Pozorski 2008:614). Over a 700 km long segment of the Peruvian coastal zone, major Initial Period settlements were established in the Lurin Valley (Burger 1987; Burger and Salazar-Burger 1991), the Rimac Valley (Ravines and Isbell 1975), at

El Paraiso in the Chillon Valley (Moseley 2001; Quilter 1985), in the Fortaleza and Pativilca valleys (Haas et al. 2004; Creamer et al. 2007), the Casma Valley (Bischoff 2009; Fuchs et al. 2009; S. Pozorski and T. Pozorski 1987, 2002, 2008), the Chao Valley (Alva Alva 1986), the Moche Valley (T. Pozorski 1990, 1995), and the Jequetepeque Valley (Tellenbach 1986). The development of these large centers was associated with a shift to inland locations adjacent to arable land, although marine resources were obtained from coastal communities. For example, in the Casma Valley, some of the earliest monumental constructions currently known are from the site of Sechin Bajo (Bischoff 2009; Fuchs et al. 2009). Sechin Bajo covers 37 hectares, and its core contains an architectural kaleidoscope of multiple constructions, sequentially constructed and reconstructed, anchored to the same pivotal location—that spans the Archaic-Formative transition. The earliest ceremonial architecture dates from 3712-3514 cal BC to 2943-2866 cal BC and was a large, 2 meter tall masonry and adobe brick platform that was remodeled and expanded at least five times. The platform was associated with a sequence of sunken circular plazas that were constructed, filled in, and rebuilt anew, their entrances and staircases repeatedly placed in the same location. Despite this detailed sequence from the ceremonial core of Sechin Bajo, there is little information about the spatial pattern of the community that may have surrounded the ceremonial architecture. At approximately 2300 – 2000 BC, construction paused at Sechin Bajo, and the site of Cerro Sechin developed as major ceremonial site in the Casma Valley, and continued to be so until 500 BC (Bischoff 2009; Fuchs 1997; Samaneigo et al. 1985), although it is not know if there was a resident population at Cerro Sechin.

At circa 2150 – 1500 cal BC, two major urban complexes evolved in the lower Casma Valley (Bischoff 2009; S. Pozorski and T. Pozorski 1986, 1987, 1989, 2002, 2008; T. Pozorski and S. Pozorski 2005). The site of Pampa de la Llamas-Moxeke, dating to 2080 -1340 cal BC,

covered 2 km^2, with two large, opposing mounds connected by five large plazas, flanked by 500 dwellings and additional residential areas housing an estimated 3750 inhabitants. Sechin Alto was almost five times larger than Pampa de la Llamas-Moxeke, with a massive mound that measured 300 X 200 m at its base and stood 40 m tall—one of the largest constructions in the New World in its era—a public monument anchoring a ceremonial core stretching 1.4 km (Figure 3). Sechin Alto's population is estimated at 18,000 residents (T. Pozorski and S. Pozorski 2005:158). Sechin Alto was the center of a multi-settlement polity incorporating several large communities

These Initial Period urban centers shared several basic elements of planning. For example, many of the centers combined large artificial mounds, plazas and sunken circular courts, and there is clear orientation between the stairways bisecting the front of the mounds and entrances in the plazas and circular courts, indicating an intentional alignment of constructed spaces. Some of these alignments may have had astronomical associations or landscape orientations, while others seem to be linked to processionals that transited the sites (Moore 1996a). Residential areas flanked this axial core with plazas generally clean of domestic debris.

After this early florescence of urbanism on the Peruvian coast, the Initial Period settlements apparently diminished in significance or were abandoned at circa 1000 - 500 cal BC Sandweiss and colleagues (2009) have suggested that this first period of Andean urbanism developed in a period of infrequent El Nino-Southern Oscillation events, a period of relative environmental stability that came to a cataclysmic end when one or more earthquakes triggered the downstream redeposition of massive quantities of sediments along the central Peruvian coast. These sediments were redeposited along the coast by longshore drift, forming beach strands and dune fields that migrated inland, blown by onshore winds and changing the local habitats in

which Aspero and Caral had developed. While a combination of seismic activity and coastal disruptions may have impacted Aspero, Caral and other sites in the Supe-Fortaleza-Pativilca region, there is no reported evidence of similar impacts on other Initial Period sites suggesting that these impacts were localized. Therefore the causes of the Initial Period sites' broad decline remain unclear.

Between circa 3000 – 1800 BC, a separate and distinct architectural tradition developed in the highlands referred to as the Mito tradition (Bonnier 1988, 1995). This architectural form is characterized by the creation of relatively small ceremonial chambers with two-level floors often covered with red earth and with central hearths that have a sub-floor flue. This form of ritual architecture is found at the sites of Piruru (Bonnier and Rozenberg 1988), Kotosh (Izumi and Terada 1972), and La Galgada (Grieder et al. 1988) and is similar to chamber constructions at Huaricoto (Burger and Salazar-Burger 1985). Despite being a relatively widespread architectural form, it is not clear how Mito ceremonial chambers articulated with residential populations; for that reason, these sites are not included in the analysis below.

Coeval with the development of coastal Initial Period urban centers, the highland pilgrimage center of Chavín de Huántar gained eminence for communities across the central Andes (Burger 1983, 1984, 1988, 1998; Lumbreras 2007; Rick 2005). The Peruvian archaeologist Julio C. Tello famously suggested that Chavín de Huántar was "la cultura matriz" or "the Mother Culture" of Andean civilization, which had colonized or artistically influenced coastal sites (Tello 1956:14-20). This hypothesis was weakened by Burger (1981) who showed that radiocarbon dating indicated that the coastal Initial Period settlements were older than domestic areas at Chavín de Huántar, leading Burger to suggest that Chavín de Huántar dated to 850 – 460 BC. Subsequent investigations by Rick and Kembel (2001) indicate that, in fact,

monumental construction at Chavín de Huántar preceded by several centuries the residences dated by Burger. These findings have led Kembel (2001:251-252) to argue that "Rather than being the "Mother Culture" or origin of Andean civilization, as proposed by Tello…or the terminal synthesis well after the collapse of earlier coastal societies, as postulated by Burger…, Chavín appears to be coeval with many coastal monumental centers that developed in the late Initial Period and the early Early Horizon and had collapsed by the middle of the first millennium B.C."

Despite the influence of its art and ideology, Chavín de Huántar was an architectural and settlement anomaly. No other known sites share any of its design elements or layout, except for the sunken circular court found even earlier at coastal sites. Regardless of its iconographic importance, Chavín de Huántar was a "proto-urban" center of less than 1000 residents at circa 500 – 400 B.C. (Chakinani Phase; Burger 1992:165-168). During the subsequent Janabarriu phase (ca. 400 – 200 B.C.), Chavín de Huántar increased in size to 42 ha, with its ceremonial architecture at its core but with a surrounding settlement of perhaps 2000 – 3000 inhabitants. Rather than a true city, Chavín de Huántar was a pivotal center both at the local level, supported by a handful of surrounding communities, and within a pan-Andean ritual topography connected by pilgrimage, trade, and cosmology.

Far to the south, another settlement pattern appears in the Lake Titicaca Basin at Middle Formative sites such as Chiripa and Alto Pukara at circa 800 – 250 BC (Chavez and Mohr Chavez 1975; Hastorf 2003, 2008; Bandy 2001, 2004; Beck 2004). These settlements were village communities organized around a central mound on top of which is a cluster of stone and adobe-walled structures that encircles a sunken rectangular courtyard (Figure 4). The best known of these is the site of Chiripa (ca. 400 – 250 BC) in which a sunken courtyard 21 X 20 m

in area was surrounded by fourteen masonry-walled structures, however recent investigations by Bandy (2001, 2004) and Beck (2004) suggest that similar mound and courtyard constructions were built at other hamlets and villages in the Lake Titicaca Basin. Although not an example of urbanism *per se*, these constructions appear antecedent to architectural forms subsequently built during the Middle Horizon at Tihuanaco and Omo (discussed below).

After 500 BC there is a multi-century retreat from urbanism along the Peruvian coast. For example, in the lower Moche Valley the Salinar phase (ca. 400 – 75 BC) site of Cerro Arena covered approximately 2.5 km^2 and contained some 2000 stone structures, ranging from simple single-room dwellings to elaborate, twenty-room elite structures (Brennan 1982; Bourget and Chapdelaine 1996). While Cerro Arena is plausibly interpreted as an urban center, it appears anomalous as other Salinar settlements are smaller hamlets and villages and Cerro Arena did not subsequently continue as an urban center (Makowski 2008:646). On the South Coast of Peru, the development of Nasca culture (ca. AD 1 -700) was unaccompanied by urbanism, despite the society's extraordinary attention to place-making and landscape (Silverman 2002:1-20). Most Nasca settlements were small hamlets and towns (Proulx 2008) with Early Nasca hamlets consisting of discrete households (Vaughn 2004). The largest known Nasca settlement, Cahuachi, consists of some forty artificial mounds, walled enclosures, large plazas and open spaces that extend over 2 km along the south bank of the Nasca River, yet excavations by Silverman and Orefeci indicate that even at its apogee (AD 1 – 300), Cahuachi was an empty ceremonial center, occupied periodically by pilgrims but with only a small permanent populations of priests and attendants (Silverman 1993: 316, 341; 2002:136-137).

After approximately AD 200, a new form of urban center emerges on the North Coast. Located on the eastern margin of the lower Moche River, the site of Moche was a city at AD 200

– 800 (Figure 5). The settlement is marked by two monumental complexes known as the Huaca de la Luna and the Huaca del Sol. Although there is debate about the sociopolitical organization of Moche society (Bawden 1995, 1996; Billman 2002; Quilter 2002; Shimada 1990, 1994), the site of Moche apparently was the seat of a multi-valley state that influenced a 260 km region of the Peruvian coast from the Chicama to the Casma valleys. Preceded by earlier Salinar and Gallinazo occupations, Moche developed into an urban center by circa AD 250-450 (Chapdelaine 2001:73; cf. Quilter 2002:175-179).

The Huaca del Sol is one of the largest constructions in the prehispanic Americas, consisting of a 40 m tall, multi-tiered platform mound constructed of more than 140 million adobe bricks (Moseley and Hastings 1975). Huaca del Sol's cruciform plan originally extended 340 X 160 m, although the northern two-thirds of the mound has been destroyed since the Colonial era (Uceda 2001:47). Five hundred meters to the south, the Huaca de la Luna Complex is 290 X 210 m at its base, and consists of three large platform mounds and four plazas (Uceda 2001; Uceda and Tufino 2003). Huaca de la Luna was built in phases, in which earlier constructions were ritually entombed and built over. The northern tiered façade of Huaca de la Luna was decorated with murals and sculpted reliefs facing an enormous 180 X 90 m plaza; this highly visible art depicts troops of warriors, processions of serpents, and other anthropomorphic and zoomorphic motifs. Uceda concluded that Huaca de la Luna was principally used for religious activities, drawing attention to the connection between ritual and power, its ritual entombment and reconstruction indicating regeneration and symbolic continuity over centuries (Uceda 2001:61-64).

Between the two huacas, urban Moche held a dense area of workshops and residences (Chapdelaine 1998, 2001, 2002, 2003; Chapdelaine et al. 1997; Gijseghem 2001). Broad avenues

and narrow streets ran north-south and east-west, while narrower alleys delineated blocks of rooms; the result was a residential area organized into semi-orthogonal room blocks. Residence complexes varied in plan and size, containing different areas for domestic activities, craft production (for ceramic production, weaving and spinning, copper metallurgy, and chicha brewing), and storage. Chapdelaine (2001:84) suggests this zone was not occupied by members of a lower class in Moche, but rather by a "middle class" and possibly even by elites. Since no residences have been found on the Huaca de la Luna and narrow streets connect the urban zone directly to that religious center, administrative elites may have also lived among the artisans at Moche.

Other Moche urban centers contain similar architectural elements, although incorporating them into different settlement plans. For example, the Moche V site of Pampa Grande in the Lambayeque valley is dominated by the enormous Huaca Fortaleza, a three-tiered pyramid 270 X 180 m at its base with a maximum height of 38 m and an estimated volume of 1.5 million cubic meters (Shimada 1994:145).[2] Huaca Fortaleza, Shimada (1994:147) writes, "represents the last glory of the long Mochica tradition of monumental platform mound construction" such as exemplified by the Huaca del Sol. Similar to the urban zone at the site of Moche, specific areas at Pampa Grande appear organized into semi-orthogonal room blocks (for example, Sector K; Shimada 1994:146). Finally there is some possibility that Pampa Grande was oriented along a line running through Huaca Fortaleza that connected it with other, smaller huacas at the site and forming an *axis mundi*, perhaps with astronomical significance.

[2] In earlier publications, Shimada incorrectly gave Huaca Fortaleza's height as 55 m (see Shimada 1994: 270, note 99) as did Haas (1985), the sources I used in previous writing about Pampa Grande (Moore 1996:57-58). To add to the confusion, Haas calls this mound Huaca Grande while Shimada refers to it as Huaca Fortaleza.

The Middle Horizon (ca. AD 650 – 1050) is marked by the emergence of two civilizations with distinctive urban traditions, Wari and Tiwanaku[3]. Drawing on distinctive cultural antecedents, Isbell (2008:745) argues that while "Huari and Tiahuanaco were historically related in their ascendancy to prominence—they were not independent evolutionary processes." Despite this, the two civilizations had profoundly dissimilar conceptions of urban forms.

Between AD 600 and 800, the urban center of Huari developed in the Ayacucho Valley of central Peru (Isbell 1991, 2008). The site of Huari had a central core of 2.5 km^2 with additional evidence of occupation sprawling over the surrounding 15 km^2, home to an estimated 20,000 – 40,000 residents (Isbell 2008:750). As Huari's population grew, vast agricultural terraces were constructed in the Ayacucho valley and surrounding regions to meet the demands of the urban populace. The city's extensive populations of artisans and crafters produced textiles and ceramics widely exchanged in the Andes (Menzel 1964). Huari's urban environment was marked by large walled compounds, enclosed plazas, and two-storey galleries. Wari architecture also included modest-sized D-shaped temples, some with elegant masonry perhaps created by Tiwanaku masons. Wari urban design incorporated the rigidly geometric subdivision of interior space (Isbell 1991; Isbell et al. 1991), a design excessively realized at the Cuzco Basin site of Pikillacta (Figure 6; McEwan 1991, 1996, 1998, 2005). Some twenty sites in the Peruvian Andes have been interpreted as Wari administrative centers (Schreiber 1987, 1992, 2001; Jennings 2006a, 2006b; Jennings and Craig 2001). The spread of Wari architectural design involved both the political imposition of urban design and the adoption of architectural styles by local polities. Not all Wari settlements reflected these principles of architectural design; for example the hilltop enclave of Cerro Baul on the south coast of Peru lacks rectangular walled

[3] Following Isbell's (2008) suggestion, "Wari" and "Tiwanaku" refer to the polities and cultural traditions, "Huari" and "Tiahuanaco" to the sites.

compounds, D-shaped temples or fine masonry despite its clear affiliation with the Wari state (Williams 2001; Williams and Nash 2002). The linear arrangement of Cerro Baul probably reflects its location on a narrow ridge rather than the principle of coordination, although the evidence of room blocks seems to suggest a semi-orthogonal pattern (Moseley et al. 2005).

In the Titicaca Basin, the Tiwanaku polity emerged as a contemporary rival of the Wari state (Janusek 2004, 2008). The capital of Tihuanaco, as Stanish (2003:172) observes, was a "vast, planned urban capital [that] sprawled over the altiplano landscape" (Figure 7). Extending over 4 – 6 km^2, widely varying population estimates have been suggested for the city, with a thin consensus suggesting 15,000 – 25,000 residents (e.g., Isbell 2008; Kolata 2003; cf. Stanish 2003). The capital's urban landscape restated a socio-religious gradient, with the city's core home to the Akapana, a stone-faced, terraced pyramid 197 X 257 m at its base and 16.5 m tall (Manzanilla 1992:22) that has been interpreted as an architectonic metaphor for a sacred mountain. Nearby, the Kalasasaya is a slightly elevated, walled enclosure measuring 120 X 130 m and containing a small (26 X 28 m) sunken court. The elite residential compound known as the Putini is due west of the Kalasasaya, while the Pumpapunku is a complex of buildings, plazas, stairways, platforms and courtyards stretching over a half-kilometer—a construction that Vranich (1999) has argued represents the center of the Andean world. Elements of Tihuanaco's urban plan recall earlier constructed forms, specifically the construction of sunken-court temples similar to that seen at the Middle Formative site of Chiripa. While most of the center's population lived in scores of dense settlements that stretched from the architectural core of Tihuanaco to the edge of Lake Titicaca (Albarracin-Jordan 1996), the center of Tihuanaco housed elite residences, elaborate architecture, and sacred spaces (Kolata and Ponce Sanguines 1992). For such reasons, Kolata (2003:176) characterizes Tihuanaco as a "mimetic urban

environment [that] became the principal template, conceived by elites, for Tiwanaku's social and moral order, and a public expression of its social values." This idea of the role of Tihuanaco as constructed template is bolstered by the distribution of the distinctive sunken-court temples at smaller Tiwanaku regional centers, not only in the Lake Titicaca basin but also 240 km to the west in the coastal Moquegua valley at the site of Omo (Goldstein 1993, 2000). In this manner, Tiwanaku's urban plan was diagrammatic.

In sum, Wari and Tiwanaku had profoundly different concepts of urban form. Tiwanaku builders erected public and elite constructions in fine masonry and commoner residences in adobe brick. Huari built with mud-plastered fieldstone, whether the constructions were elaborate or rustic. Tiwanaku created a highly visible built environment in which gateways framed vistas, pyramids mirrored mountains, and constructions represented the cosmos. Huari built walled compounds, imposing a replicative architectural form "proclaiming the domestication of landscape" (Isbell 2008:746). Wari and Tiwanaku expressed very different conceptions of Andean urbanism.

As the Moche waned on the North Coast of Peru, two cultural traditions developed: the Lambayeque[4] and the Chimú (Dulanto 2008). The origins of these two culturally-related prehistoric societies are poorly known. Lambayeque/Sicán apparently developed at circa AD 750 – 900 in the vast multi-valley complex watered by the adjacent Motupe, La Leche, Lambayeque, Zaña and Jequetepeque rivers. The earliest Lambayeque/Sicán center was the enormous settlement at Batan Grande located in the central La Leche valley (Shimada 1981, 1990, 1995). Batan Grande remained the major center through the Middle Sicán phase (AD 900 – 1100), a period marked by Lambayeque's increasing prestige reaching all the way to Tumbes. During the Late Sicán phase (AD 1100 – 1375) Batan Grande was burned and abandoned, and

[4] The Lambayeque culture is referred to as Sicán by Shimada.

the major center shifted some 23 km downstream to the site of Tucumé (Heyerdahl et al. 1995). This change may indicate, as Sandweiss (1995:65) writes, "that a number of smaller polities shared Lambayeque culture, with Tucumé as primus inter pares" given its concentration of monumental architecture. Tucumé continued to be the major Lambayeque center until the Chimú conquered the Tucumé and other Lambayeque centers at AD 1360 -1400 (Moore and Mackey 2008). Throughout much of this period, the enormous site of Pacatnamú, located at the mouth of the Jequetepeque valley was a major Lambayeque/Sicán religious center (Donnan and Cock 1986). Lambayeque/Sicán settlement patterns are difficult to summarize (Shimada 1990:333-350), although they exhibit a basic practice: the combination of large platform mounds and walled enclosures. This is particularly true during the Middle Sicán period, which Shimada (1990) characterizes as "a definite resurgence of monumental religious structures…first seen during Moche V times" but which ebbed during Late Sicán, when the focus of monumental architecture shifts to walled enclosures that often contain platform mounds, although smaller than earlier Moche constructions and often obscured behind tall adobe brick walls. While air photos and maps of Batan Grande and Tucumé indicate settlements of large rectangular walled compounds containing platform mounds, plazas, and room groups, there is not clear evidence for a coherent, overarching settlement plan except for a weak coordination (Figure 8). In contrast, several massive walls curve across the urban core at Pacatnamú whose walled compounds appear oriented to an approximate orthogonal grid.

Between AD 900 and 1470, the largest urban center on the Peruvian coast was Chan Chan, the capital of the Chimú Empire (Figure 9). Located in the lower Moche Valley, Chan Chan had a densely occupied urban core covering 6 km^2 with an estimated population of 30,000 – 40,000 residents, an order of magnitude larger than any other known Chimú settlement

(Keatinge 1975; Kolata 1990; Moseley and Day 1982; Moseley and Mackey 1974; Moseley and Cordy-Collins 1990; Moore and Mackey 2008).

Chimú urban architecture emphasized walled compounds. Although walled compounds were also constructed by the Lambayeque/Sicán, the Chimú constructed distinctively grandiose walled compounds (Moore 2005:189-210). Chan Chan was dominated by ten large compounds (*ciudadelas*) surrounded by up to 9 m tall walls made from tapia and adobe bricks. The ciudadela walls enclosed areas of 6.7 to 21.2 ha and contained 113 to 907 interior rooms, plazas, storerooms, burial platforms, and three-sided niched rooms known as audiencias (Moore 1992, 1996a; Moore and Mackey 2008). Each ciudadela was probably associated with a specific Chimú king. The ciudadelas are interpreted as the royal residences, administrative centers, and ultimately funerary complexes of the kings of Chimor (Conrad 1982; Day 1982; Moore 1996a:68-90). A jumble of dwellings and workshops surrounded the ciudadelas. As an urban landscape, Chan Chan evolved without an overarching plan, an exclusive elite district, or demarcated ceremonial core. Commoners lived and worked in modest cane-walled structures with cobblestone foundations and flat roofs of bulrush matting; some of the commoner structures literally abutted the ciudadela walls. Non-royal elites lived in adobe-walled compounds that exhibit some of the architectural traits of ciudadelas—such as ramps, benches, storerooms and niches—but were smaller, less complex, and lacked burial platforms. Four mounds or huacas, now largely destroyed by looters, stood in the eastern half of the city; separated from each other by 500 – 1000 m, the huacas do not define an obvious ceremonial center. As Conklin (1990:61) has concluded, “There is little about the plan of Chan Chan as a whole that speaks of singularity or of a unified state.”

Not surprisingly, Chan Chan was not an architectural template for other Chimú settlements, although there are clearly shared architectural inventories between the capital and provincial centers (Mackey 1987, 2006; Mackey and Klymyshyn 1990; Moore and Mackey 2008). For example, audiencia-like features are known from the Chimú occupation of Farfan in the Jequetepeque Valley and from Manchan in the Casma Valley on the empire's southern frontier. At Manchan four isolated walled compounds exhibit some of form and plan of Chan Chan's elite architecture, such as baffled entries, ramps and benches. Despite incorporating these elements of Chan Chan's architecture, neither site exhibits an obvious overarching plan.

The Inca Empire (AD 1400 – 1532) created the largest urban centers known in prehispanic South America (D'Altroy 1992; Rowe 1946). Emerging in the Cusco Basin in the competitive political arena partially caused by the fading of Wari control (Covey 2009:84-91), the Inca state evolved during AD 1000 – 1300 (Bauer and Covey 2004). As the polity grew so did Cusco, becoming the principal urban center of some 50 ha (Figure 10). Surrounded by several satellite towns, Cusco was a metropolitan area covering several square kilometers with its most prestigious architecture at its political, religious, and cosmological core.

The explosive 15th century expansion of the Inca Empire was accompanied by one of the largest construction programs in the prehistoric New World: roads, fortresses, bridges, storage facilities, temples, road-side way stations (tambos), colonies, and provincial centers were built over some 4500 km along the length of the Andes (Gasparini and Margolies 1980). Not all Inca sites were Inca constructions; pre-existing settlements were incorporated into the Inca state, often with minimal modifications (Morris 2008). And while there was a large degree of variation in Inca settlement planning, as Hyslop (1990) discussed, there were also significant patterns in the construction of Inca urban centers.

Inca architecture was constructed from fine cut masonry, field stone, and adobe. The finest masonry constructions were royal palaces and temples, while fieldstone and adobes were used for residences, storerooms, and other constructions (Hyslop 1990; Protzen 1993). A distinctive element in Inca constructions was the use of trapezoidal doorways, windows, and niches. In the highlands, structures had gabled or hipped roofs covered with thatch (Hyslop 1990:6), while flat roofs of rush mats were used on the rainless coast. A common domestic unit was the *kancha*, a rectangular walled compound that enclosed several rectangular buildings and an open plaza. These kanchas, in turn, were replicated in Inca settlements, often organized as modular residential blocks.

Major Inca settlements followed specific planning principles (Hyslop 1990:191-222). Some settlements were ordered on an orthogonal plan of gridded streets that formed rectangular or rhomboidal blocks (e.g., Ollantaytambo, Chucuito, Torata Alta [Hyslop 1990:192-201]). Other settlements (e.g., Cusco, Huanuco Pampa, Inkawasi; Hyslop 1990:202-221) exhibited a radial plan, with streets or blocks of buildings extending out from a pivotal space, such as a plaza or *ushnu* (a stepped platform). Inca settlements also included plazas of varying sizes; some plazas were large, rectangular and centrally located, while others were located at one end of a settlement in the form of a rough quadrilateral without parallel sides. Inca settlements also incorporated a variety of natural features including flowing water, rocks and outcrops, as well as agricultural terraces for growing ritual crops (Hyslop 1990). Some architectural features were aligned with solar and stellar events.

Cuzco served as a architectonic model for other Inca cities and sites, such as Quito, Tombebamba (Cuenca, Ecuador), Huanuco Pampa (Morris and Thompson 1985), and even the pilgrimage shrines on the Islands of the Sun and the Moon in Lake Titicaca (Bauer and Stanish

2001). Although some of these sites were referred to as "New Cuzcos," they were not diagrammatic replicas but rather constructed representations of Inca "mythical space." These other Cuzcos incorporated architectural features found in the capital, as Lawrence Coben has noted, expressing "varying degrees of iconicity…at multiple scales and across numerous features, [although] none of the new of other Cuzcos is a precise physical copy of each other or of the capital itself" (Coben 2006:233-234.) As Hyslop (1990: 304) observed, "the meaning of these design components that makes for the profound similarities with Cuzco." In this manner, even Inca settlements far from Cuzco expressed "much about how the Inkas viewed their own social structure, the organization of their state, and their relationship to the environment and the cosmos" (Hyslop 1990:304-305).

Coordination and Standardization in Andean Urban Traditions

Table 1 is an attempt to explore the domains of coordination and standardization in Andean urban traditions over a period of some five millennia. It is important to understand the limits to these results. First, the selected settlements are clearly biased towards larger and better-studied sites; it is difficult to know exactly how representative they are of settlement patterns of an entire culture. Second, classification of the sites in terms of Smith's nominal variables was based on visual inspection and judgment rather than a more precise measurement and analysis. Finally, the number of sites representing a specific urban tradition is very small, ranging from single cases (e.g., Chavín de Huántar, Cerro Arena) to a maximum of five cases for Wari.

And yet some interesting patterns emerge from these data, minimally sufficient to suggest lines for future research. First, it is relatively common for sites to exhibit some form of coordinated urban plan, although the principles of that co-ordination vary enormously whether the settlement is organized around a central plaza (e.g., Caral, Cusco), a chain of plazas and

mounds (e.g., Initial Period sites), major mounds (e.g., Pampa Grande, Moche), or other alignments (e.g., Pacatnamú). Second, there seems to be a fundamental change in monumentality that occurs during the Early Intermediate Period, particularly along the Peruvian coast, in which the focus of monumental constructions shifts from mounds to walls (Moore 1996a:101-105). Third, relatively few Andean urban traditions exhibit solid evidence of orthogonal planning; essentially there are some sites that appear to exhibit a semi-orthogonal pattern (which Smith notes can result in the absence of centralized planning), whereas an emphasis on modular orthogonal planning characterizes Wari settlements and the use of integrated orthogonal planning is evident at some Inca sites (Cusco, Chucuito) and radial plans are found at others (Huánuco Pampa). Finally, only in the Tiwanaku case is there reasonably clear evidence of diagrammatic coordination.

Table 2 simplifies the results for co-ordination in these Andean urban traditions and compares them to evidence for standardization. Admittedly there is a loss of information involved in Table 2, but it is easier to see a basic point: there is a significant lack of continuity among these different Andean urban traditions in reference to co-ordination and standardization. The only traditions in which some continuities are potentially discernible are: 1) the presence of sunken circular courts at Caral, other Initial Period sites and Chavín de Huántar, and 2) between the Middle Formative tradition at Chiripa and Alto Pukara and the later Tiwanaku sites, specifically with reference to the sunken court temples. Interestingly, these architectural elements are generally interpreted as ritual structures, and thus may be correlated with power rooted in religious institutions. One might also argue for some constructed continuities between large platform mounds constructed by the Moche and those subsequently built by

Lambayeque/Sicán polities, although the later urban tradition enclosed the large mounds within walled enclosures, which may be a significant difference.

Beyond these possible continuities, Andean urban traditions seem best characterized by their differences and significant variations. For example, the settlement plan of a linear arrangement of plazas and sunken circular courts with large terminal platform mounds that so clearly characterizes the coastal valleys during the Initial Period is never reprised subsequently. Although there may be some broad affinity between the large walled compounds found in Wari architecture and Chan Chan's ciudadelas (as argued by McEwan 1990), the similarity is weak, generic and outweighed by the differences between Wari and Chimú walled compounds (e.g., fieldstone vs. adobe brick, multi-storied constructions vs. enclosing walls, internal orthogonal modular construction vs. burial platforms, plazas, storerooms and diverse internal constructions.) The diagrammatic sunken court temples of Tiwanaku have no subsequent parallels. Inca integrated orthogonal and radial plans have no known antecedents. Even within a specific cultural tradition a settlement template is usually absent, with the exception of the Initial Period major centers of the central Peruvian coast . In other cultural traditions, architectural inventories may be shared at different sites—for example, sunken circular courts and hearths with sub-floor flues in Preceramic and Initial Period sites; large platform mounds among Moche sites; audiencias, bench and ramp, and baffled entries among Chimú sites, and central plazas, ushnus, and trapezoidal doors and niches at Inca sites—but even then there is never a rigid reproduction of urban form.

This broad—and admittedly incomplete—overview of Andean settlement forms suggests that there is little diachronic continuity in coordination and standardization in urban planning. It is as if Andean urban centers were repeatedly re-invented, expressing new conceptions of

architectural form and social order without referencing earlier practices. Possible reasons for such discontinuities are discussed below.

Discussion

The Andean situation appears to differ from other regions of the world where urban forms are marked by strong continuities. One thinks of the deep continuities in orthogonal grid, initiated as early as the Late Bronze Age of the Aegean (cf. Fisher, this volume), with antecedents in the Late Bronze Age (cf. Creekmore, this volume) and fully realized in the Classical Greek city, developed and incorporated into the Roman Empire, and translated by Spain into the Americas (Rykwert 1976) or the stunning resiliency of the form of imperial Chinese capitals which architectonically encoded cosmological principles from 221 BC to AD 1912, a marked continuity despite the introduction of new religions, foreign conquests, and the establishment of new dynasties (see Razeto, this volume). Even looking at non-state societies, between AD 750 and the present Ancestral Puebloan and Pueblo architecture in the American Southwest exhibit much greater continuity with their emphasis on blocks of rooms, subterranean kivas, and plazas, and there are well-recognized continuities between Ancestral Pueblo architecture and earlier Basketmaker pithouses. Despite having important variations in built forms—e.g., the development and abandonment of cliff dwellings, the creation of multi-storied dwellings—the settlement continuities in the American Southwest were maintained despite environmental stresses, migrations, and Euroamerican invasions.

The apparent difference between Andean patterns and urban planning elsewhere in the prehispanic Americas is indirectly alluded to by Smith in comparing Inca and Aztec settlement patterns:

> …similar planning patterns in different cultures can arise for very different reasons. A comparison of planned cities in the Aztec and Inkan empires illustrates this point. Aztec

> Tenochtitlán and Inkan Cuzco were capitals of powerful empires. In both cases, there were architectural similarities between the capitals and their provinces in the forms and inventories of buildings, and in urban layouts. But when a broader array of evidence is considered, it becomes clear that *these similarities had radically different origins. In the Inkan case, similarities arose from deliberately imposed imperial construction programs. In the Aztec case, similarities in both building forms and city layouts predated the formation of the empire by several centuries, and can best be attributed to the basic cultural uniformity of central Mexican Aztec peoples and interaction among localized elite groups in the Early Aztec period.* (Smith 2007:40; emphasis added)

Smith's observation regarding central Mexico may be indicative of a fundamental contrast between the continuities in Mesoamerican urban planning and the discontinuities visible in the prehispanic Andes. In another article, Smith (2008:578-579) suggests that there was an essential core of ancient Mesoamerican principles of urban planning, one of which was an inventory of public architecture: "A basic set of public buildings was used in most ancient Mesoamerican urban centers: large temple-pyramids, smaller temples, royal palaces, ballcourts, and suite of less-common special purpose buildings that included council halls, sweatbaths, schools, and other structures" (Smith 2008:578). This is not to say that all these constructions were employed by all Mesoamerican societies. For example, the ball court—which Kirchoff (1952) cited as a key trait in the definition of the Mesoamerican culture area—was not incorporated into the largest of all Mesoamerican urban centers, Teotihuacan. As Esther Pasztory (1997: 235) observed, "Teotihuacan is unique in having no ball court, although some scholars have suggested that sections of the Avenue [of the Dead] could have functioned as ball courts" (for a recent discussion, see Uriarte 2006). The absence of a ballcourt at Teotihuacan is an intriguing absence of an key element in the Mesoamerican architectural inventory, a constructed form that appears at circa 1600 cal BC on the Pacific coast of Chiapas (Hill and Clark 2001), and was incorporated into many—although not all—Mesoamerican urban centers for the following 3100 years (Scarborough and Wilcox 1991).

To cite another example, in the Mirador Basin of the northern Peten "the modal attributes of later Maya architecture were introduced" at circa 600 – 400 cal BC incorporating the construction of monumental platforms (Hansen 1998:63). More specifically, the so-called "E group pattern" "consists of a large pyramidal structure on the western side of a plaza or platform; the eastern side of the plaza is dominated by an elevated, elongated structure on a north-south axis" (Hansen 1998:64), an architectural pattern that continued well into the Late Classic (ca. AD 750 – 900) at lowlands sites such as Tikal, Calakmul and Uaxactun among others (Hansen 1998:70).

To reiterate, I am not suggesting that such architectural units were found universally across the width of Mesoamerica, nor am I ignoring strong regional variations and continuities within Mesoamerica. Obviously, there are significant differences among Mesoamerican urban traditions. The integrated orthogonal plan of Teotihuacan has no clear counterpart. The circular settlement patterns of the Teuchitlán tradition of west Mexico is distinctive. And yet, I know of no building within the architectural inventories of the prehispanic Andes that was recurrently used over 3100 years, and only in the Titicaca basin is there anything approaching the continuity in construction forms documented for some 1300 years of prehistory in the Peten. Simply put, the Andes do not seem to exhibit the same level of diachronic continuities in urban form that is discernible at various places and times in Mesoamerica.

Contrast, as an example, Kirchoff's (1952) rather straightforward (and, in retrospect, arguably over-stated) claim that stepped pyramids and ball courts were two of the traits "defining" Mesoamerica as a culture area with Wendell Bennett's contemporary and theoretically similar discussion of architecture in the Central Andean culture area:

> Large scale building was a unique characteristic of the Central Andean pattern. These large building projects might be for religious constructions, that is, pyramids or temples,

> for palaces of the rulers, for fortifications, of for public works such as irrigation systems and roads. All categories are characterized by the large scale of the work and the necessity for well-organized labor. Irrespective of detailed differences, such large-scale construction is found in the Chavín Periods [sic], in the early periods of Tiahuanaco and Mochica, and in all the Middle, Late and Inca Periods. In the beginning the emphasis was placed on mainly religious structures, but later large-scale public works, fortifications, and palaces were also constructed (Bennett 1946:25-26).

Benefiting from more than six decades of archaeological research and the advantages of absolute dating, we would modify some of Bennett's statements even while retaining his basic insight: Andean architecture and settlements exhibit fundamental differences throughout prehistory.

Thus, an overview of Andean urban planning and architectural forms indicates major discontinuities both diachronically and synchronically. Earlier design elements are not replicated by subsequent societies, with two notable exceptions: 1) the presence of sunken circular courts at Caral, other Initial Period sites, and Chavín de Huántar, and 2) the presence of sunken court temples from the Middle Formative to the Middle Horizon in the Titicaca Basin and southern Andes. Synchronically, the best evidence for the imposition of standardized urban forms come from 1) the central Peruvian coast during the Initial Period, 2) the use of some standard architectural inventories in Moche (platform mounds) and Chimú buildings (audiencias, baffled entries, ramp and bench), and 3) the use of orthogonal and radial urban plans in Inca settlements.

I cannot explain this lack of continuity in Andean urban plans; at best, I can only exclude some explanations as unlikely and suggest other possible lines for further inquiry. First, the differences between Mesoamerica and the Central Andes are not explained by gross differences in geographic scale, latitudinal reach, or other broad environmental differences. From its approximate northwestern frontier in Sinola to its southern boundary in Central America (Weaver 1993), Mesoamerica extends over some 3000 kilometers and 15 degrees of latitude.

The Central Andes stretch some 1700 kilometers and 11.5 degrees of latitude. While the Andes exhibit some of the highest levels of biodiversity known, Mesoamerica is not environmental homogenous. It seems unlikely that the differences between Mesoamerica and the Central Andes in the variations of urban plans can be explained in terms of broad environmental or geographic differences.

Another possibility is that the combination of El Niño events, earthquakes, drought and flooding in the Andes created an environment that was inherently unstable, selecting for punctuated equilibria as Moseley (1987) has suggested. A number of scholars have discussed the role of El Niño/Southern Oscillation (ENSO) events, droughts, and seismic shifts in a catastrophist view of Andean prehistory (for excellent recent overviews, see Contreras 2010 and Sandweiss and Quilter 2008). Wells and Stoller (1999) have argued that even in the absence of such catastrophic ends, the regular fluctuations of Andean paleoclimates would tend to select for cultural innovations and changes. The Andes exhibit an extremely volatile pattern of long-term climatic and seismic fluctuations. Dillehay and Kolata (2004:4328-29) have discussed the multiplicity of human responses to environmental uncertainty on the North Coast: "the development of flexible, opportunistic" agrosystems, the creation of redundant hydraulic systems, and designing infrastructure to "withstand environmental perturbations." Although human responses to environmental uncertainty can be broadly characterized, understanding the impacts of a prehistoric ENSO events on a given Andean polity requires regional data and specific investigation of local consequences. For example, Billman and Huckleberry (2008) present data on the frequency and magnitude of ENSO events on the North Coast of Peru. Several points are relevant. First, the impacts of an ENSO event vary even in adjacent valleys; the Moche Valley, with a smaller drainage catchment, was less affected than the neighboring

Chicama Valley, with its larger catchment that channeled large volumes of floodwaters, stripping away top soils from the middle valley and burying downstream farmlands in thick strata of silt. Second, this fundamental inter-valley difference may have been an advantage for prehispanic political leaders in the Moche; Billman and Huckleberry write:

> …disastrous El Niño events represented a fundamental challenge to the political and ideological legitimacy of Chimú royalty. Because they were responsible for maintaining the natural order, rulers would have had to meet spiritual obligations embodied in their divine status. In other words, Chimú royalty had to work to maintain the faith of the people in the ideological system, which was the basis of royal legitimacy….
>
> The warning signs of an impending El Niño would have also provided an opportunity for rulers to demonstrate their divine connection. With the first signs of an El Niño, rulers could have sought help through the performance of rituals. The recognition of the legitimacy of divine rulers capable of supernatural intervention seems at odds with the periodic occurrence of very strong El Niño event, because divine rulers would have been blamed for such events. However, because most such events do not result in severe flooding, *divine intervention of leaders would have appeared effective most of the time*….
>
> Perhaps because the Moche Valley was less susceptible to flooding during very strong events, ruilers there would have appeared moide successful in their divine interventions than leaders in other valleys. (Billman and Huckleberry 2008:123-124, emphasis in the original).

It is undeniable that the Andes present a challenging environment for human societies. It is plausible that these levels of environmental unpredictability might underlay the discontinuities in Andean settlement patterns, but a simplistic connection between perturbations in the environment and discontinuities in settlement patterns faces several immediate challenges. First, there are settlement patterns and architectural traditions that survive despite evidence for major environmental changes. Just as Billman and Huckleberry's model predicts, there are no discernible ruptures in Chimú settlement patterns or monumental architecture although a major ENSO event occurred in the mid-14th century AD that required major state-level response (Moore 1988, 1991), and monumental architecture at the Chan Chan exhibits a striking formal continuity over some six centuries (Day 1982; Kolata 1982). Thus, the paleoenvironmental

evidence, not unexpectedly, fails to neatly correlate with major changes in settlement patterns and urban planning (Figure 11).

But in the absence of direct evidence for a settlement's destruction—an unambiguous devastation like Pompeii, to cite a ready example—we still need to understand the social, political, economic and religious connections between environmental perturbations and cultural responses. Other avenues might lead to alternative hypotheses. For example, Huertas (1991) discusses how ENSO events and other forms of environmental perturbations led to the relocation of ethnic groups from Piura and Lambayeque to other regions in far northern Peru during the late prehispanic and Colonial period, and ENSO events have led to migrations from the Piura highlands to the Pacific coast of Tumbes in the late 20th century. Perhaps, a combination of environmental disruptions and ethnic movements created the complex mosaic of settlement patterns in the prehispanic Andes.

A final possibility is that differences in Andean urban plans reflect, in part, variations in structural power, although demonstrating this entails a research program that extends far beyond this chapter. As an overarching hypothesis, one can suggest that divergent patterns of "top down" urban planning and monumental constructions reflect new forms of structural power that vary in magnitude, coherence, ideology, organization, and objectives. For example, Rice has recently discussed the creation of the Inka administrative center of Torata Alta, in the Moquegua Valley of southern Peru, which was then transformed into a Spanish Colonial reduccion in the late sixteenth century, a shift in structural power that was accompanied by new urban forms and constructions (Price 2012). Price writes:

> Newly established reduction towns, like other colonial cities, were structured according to specific standards; centered on a plaza with a grid of wide, straight streets dividing the community into residential blocks…. Around the plaza various public buildings were arrayed, the most important of which was the church as well as houses for Spanish

> officials and the indigenous leader (*kuraka*, *cacique*) and corrals for livestock. Individual residences were to be occupied by nuclear families, with separate rooms for males and females and with door opening to the street rather than shared courtyard spaces. The goal was to segregate the sexes, especially unmarried daughters, and thereby limit potential sexual contact between relatives (Price 2012:4)

Just as a "non-local" orthogonal urban plan had been imposed upon Torata Alta when the Inca Empire conquered the Moquegua Valley, the construction of a central plaza and church and the gendered segregation of residential spaces under Spanish colonialism were reorderings of the built environment that mark the deployment of structural power. Price's analysis points the directions for future inquiries.

Extending this line of analysis from the Colonial era into prehistory demands new scholarship into the political organizations of ancient Andean societies and the creation of the built environment. Elsewhere I have outlined a preliminary attempt linking ideologies of power and the built environment has contrasted between the Inka political strategy of extending fictive kinship to peoples and territories distant from Cusco versus the Chimú ideology of separation, two distinct visions of power that were variously expressed in the built environment (Moore 2003, 2004). Admittedly, this narrowly defined analysis resulted in somewhat limited inferences, but it serves as another study of variations in structural power and the built environment in the ancient Andes. I contend that such a line of investigation will be archaeological valuable, although much additional work is needed.

In conclusion, the distinction between "planned" and "unplanned" urban centers masks significant variation, as Smith has argued. Yet, an analysis of coordination and standardization in a small sample of Andean urban plans suggests that there were significant disjunctures throughout four millennia. Admittedly, I am unable to explain this variation, but explanation first requires that we understand such variations exist. This perspective contrasts with efforts to

delineate broad continuities in search of an essential and resilient Andean quality, the intellectual quest for "lo andino." That search for normative continuities overlooks significant variations in prehispanic cultural practice, including architecture and the built environment, variations that potentially illuminate the distinctive developments of complex societies in Andean prehistory.

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Figure Captions

Figure 1: Locations of Selected Sites discussed

Figure 2: Caral

Figure 3: Sechin Alto (redrawn from S. Pozorski and T. Pozorski 2008)

Figure 4: Chiripa

Figure 5: View across Moche to Huaca del Sol (J. Moore 2003)

Figure 6: Pikillacta (redrawn from McEwan 1990).

Figure 7: Tiwanaku

Figure 8: Lambayeque Sites: Tucume (left) Pactnamu (right)

Figure 9: Chan Chan, Schematic Plan of Urban Core.

Figure 10: Plan of Cusco

Figure 11: Diachronic Paleoclimate Chart (from Wells and Noller 1999)

Table 1

Table 2

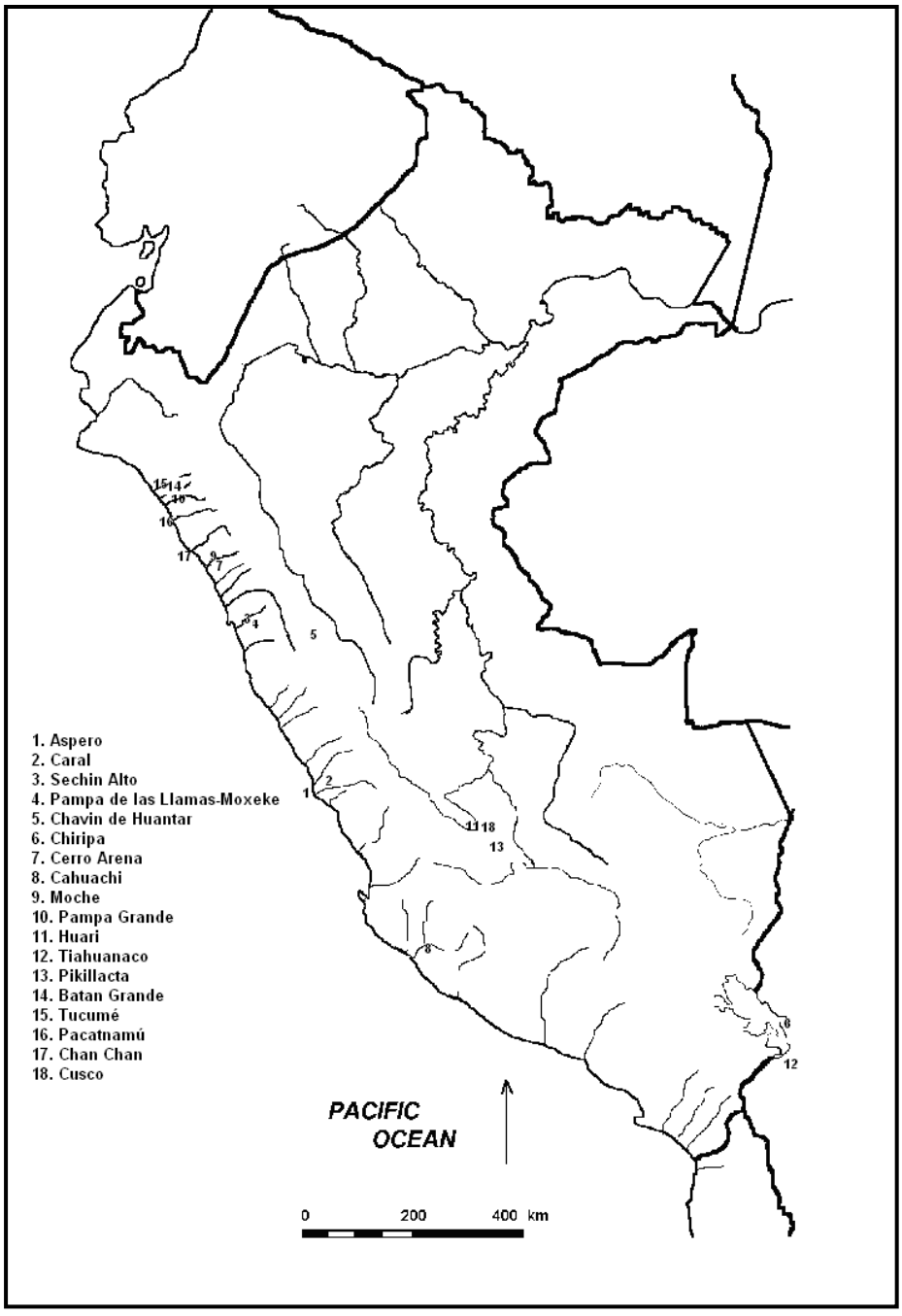

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Figure 2: Caral

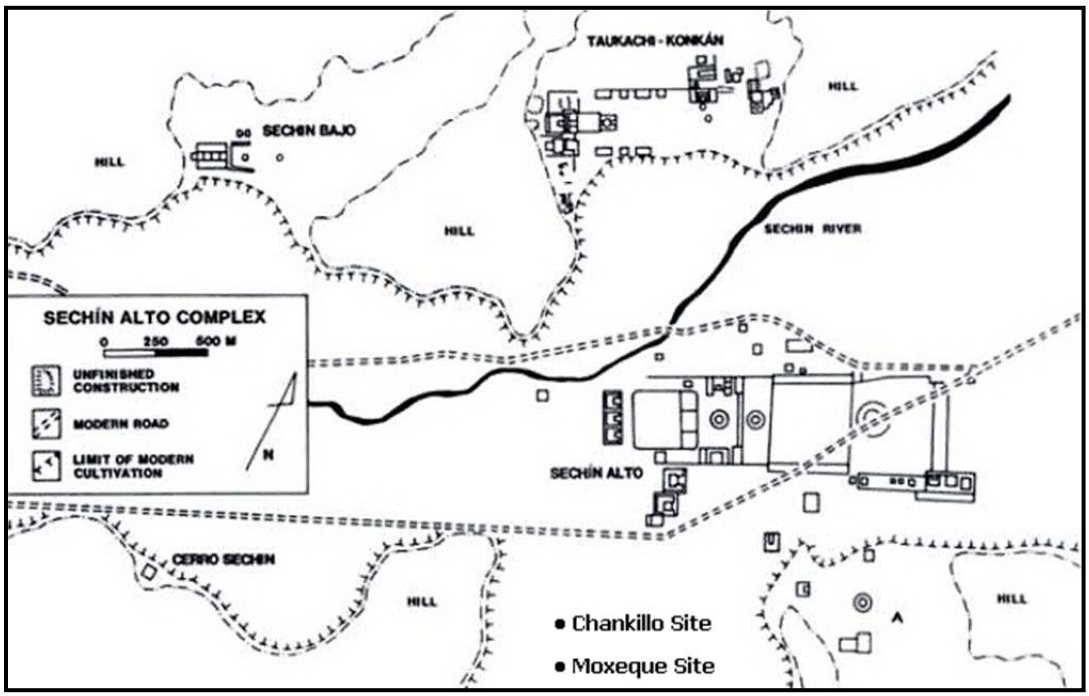
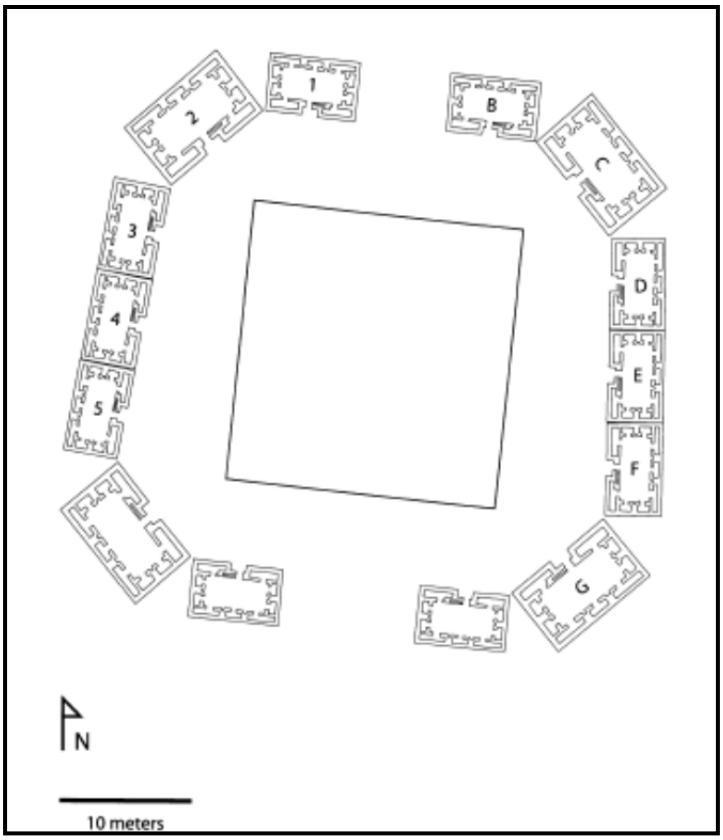


Figure 3: Sechin Alto (redrawn from S. Pozorski and T. Pozorski 2008)



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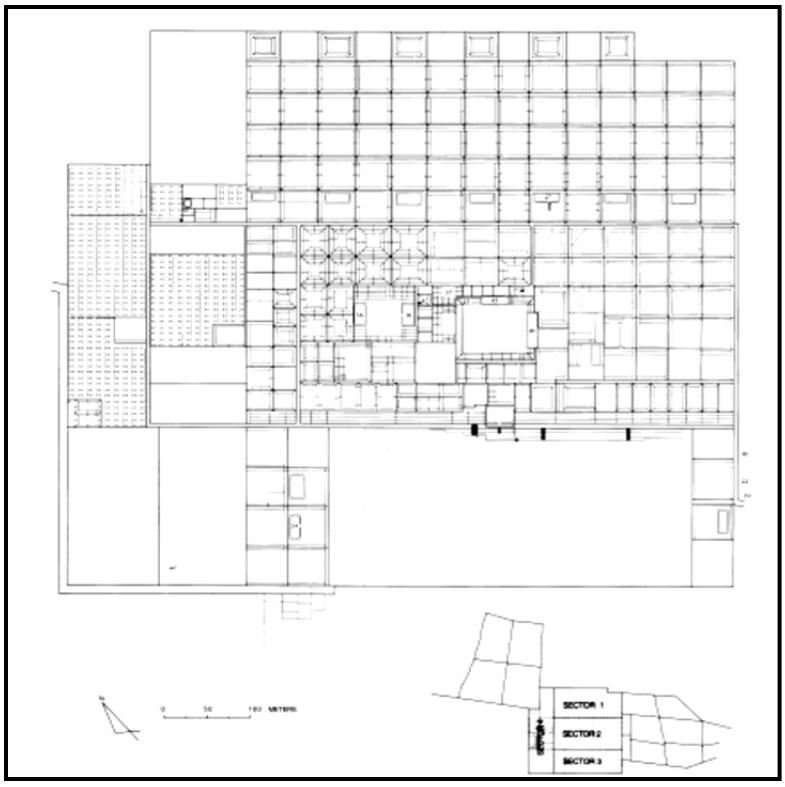

Figure 6: Pikillacta (redrawn from McEwan 1990).

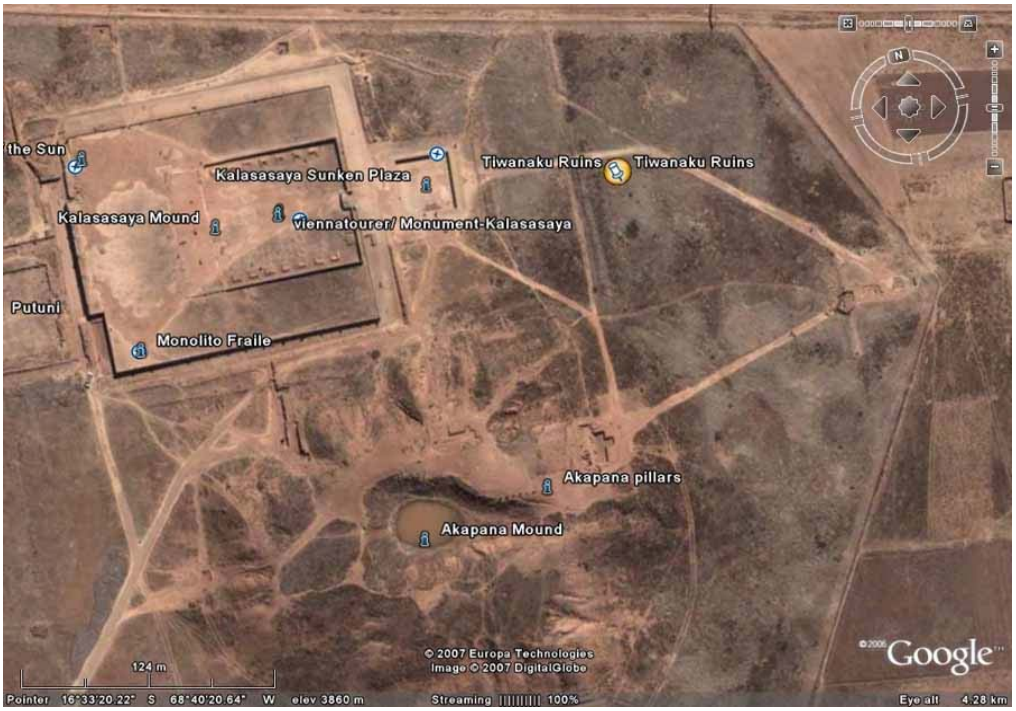

Figure 7: Tiwanaku

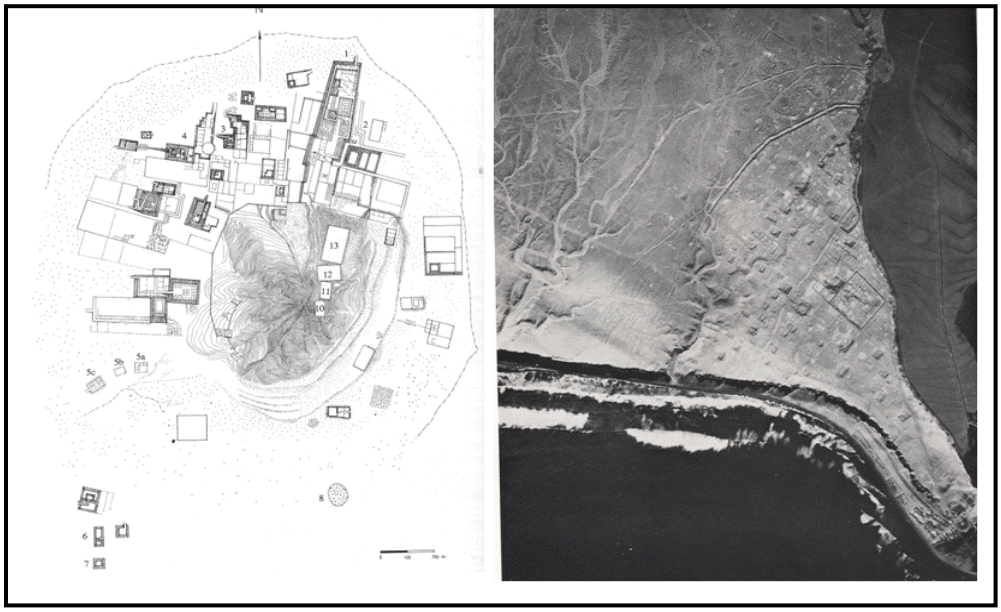

Figure 8: Lambayeque Sites: Tucume (left) Pactnamu (right)

Figure 9: Chan Chan, Schematic Plan of Urban Core.

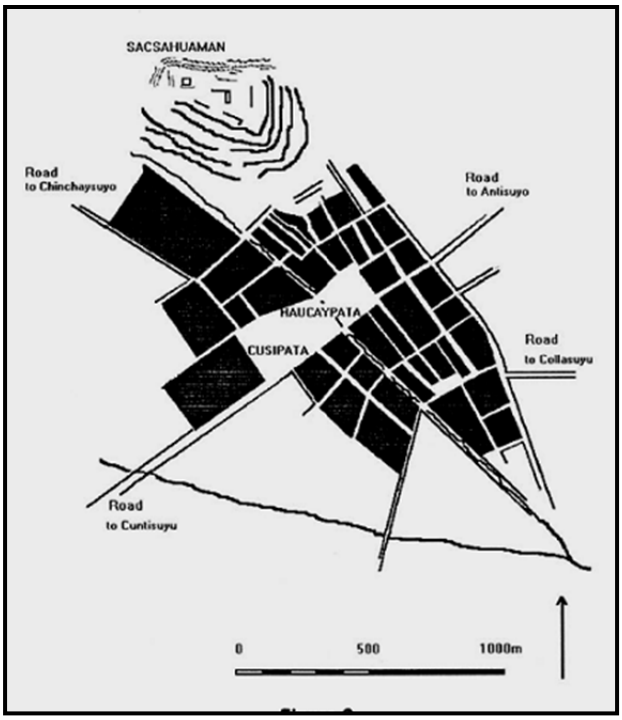

Figure 10: Plan of Cusco

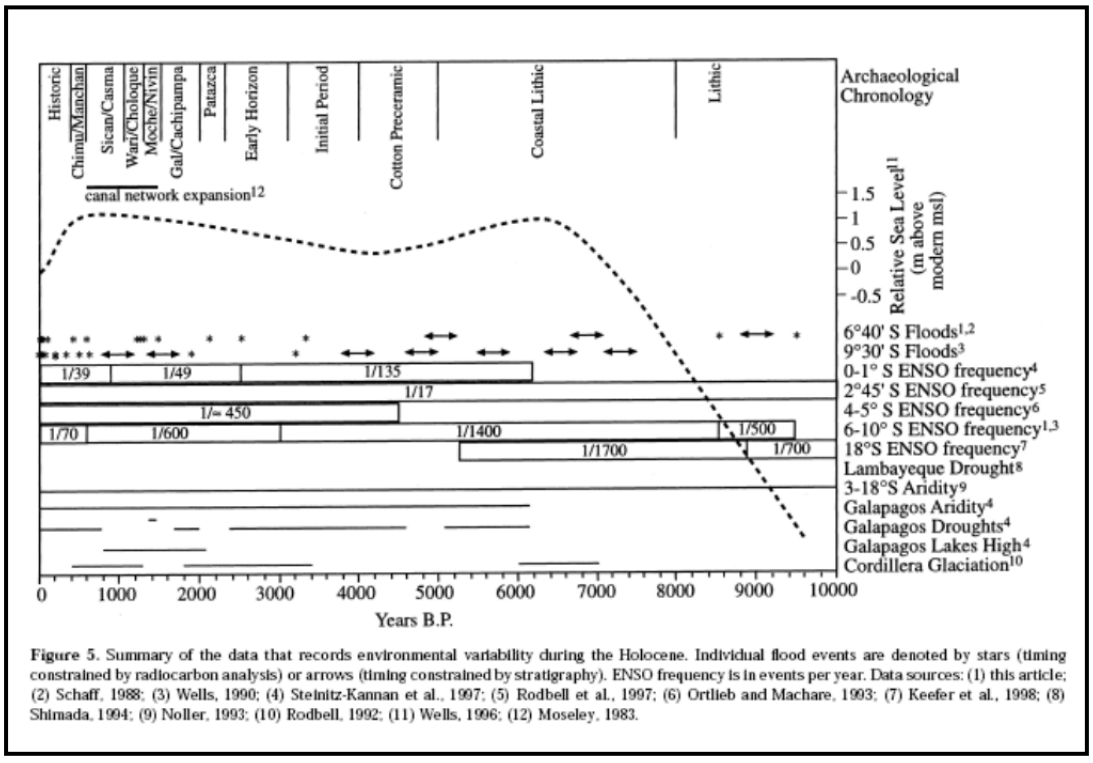

Figure 5. Summary of the data that records environmental variability during the Holocene. Individual flood events are denoted by stars (timing constrained by radiocarbon analysis) or arrows (timing constrained by stratigraphy). ENSO frequency is in events per year. Data sources: (1) this article; (2) Schaff, 1988; (3) Wells, 1990; (4) Steinitz-Kannan et al., 1997; (5) Rodbell et al., 1997; (6) Ortlieb and Machare, 1993; (7) Keefer et al., 1998; (8) Shimada, 1994; (9) Noller, 1993; (10) Rodbell, 1992; (11) Wells, 1996; (12) Moseley, 1983.

Figure 11: Diachronic Paleoclimate Chart (from Wells and Noller 1999)

Tables

		COORDINATED	FORMALITY	MONUMENTALITY mounds	MONUMENTALITY walls	ORTHOGONAL semiorthogonal	ORTHOGONAL integrated	ORTHOGONAL modular	ORTHOGONAL radial	DIAGRAMMATIC
PRECERAMIC										
	Aspero	–		?						
	Caral	√		√						
INITIAL PERIOD										
	Sechin Alto	√		√						
	Pampa de las Llamas-Moxeke	√	?	√						
	Las Aldas	√		√						
EARLY HORIZON/FORMATIVE										
	Chavín de Húantar	√		√						?
	Chiripa	√								?
EARLY INTERMEDIATE PERIOD										
Salinar	Cerro Arena	–								
Nazca	Cahuachi	?		√						
Moche	Moche		√	√	√	√				
	Pampa Grande	√	√	√	√	√				
MIDDLE HORIZON										
Wari	Huari	–			√			√		
	Pikillacta	?			√			√		
	Azangaro	–			√			√		
	Viracocha Pampa	√			√					
	Cerro Baul	?			√	√				
Tiwanaku	Tihuanaco	√	√	√						√
	Omo	?				√				√
LATE INTERMEDIATE PERIOD										
Lambayeque	Batan Grande Tucumé									
	Pacatnamú			√	√					
Chimú	Chan Chan	–	?		√					
	Farfan				√					
	Manchan	?			√					
LATE HORIZON										
Inca	Cusco	√	√				√		√	?
	Huanuco Pampa		√						√	
	Chucuito		√				√			
	Tombebamba		?							

Table 1

	Standardized	Mixed	Non-standardized
Coordinated	Initial Period		
Formality			Moche?
Monumentality			Nazca/Moche/Lambayeque
Orthogonal			
semi-orthogonal		Chimu	Moche
integrated		Inca	
modular			Wari
radial		Inca	
Diagramatic		Tiwanaku	Chavin?
			Chiripa?

Table 2