Political Landscapes of Capital Cities

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INTRODUCTION

Throughout time people have tended to view their own place of settlement as central to the order of the universe and, accordingly, have built substantial structures or transformed entire landscapes to conform the physical world to their cosmological view. This representation of the cosmos, usually conveyed symbolically through images, oral histories, rites, and architecture, affords “a ritual paradigm of the ordering of social interaction at the same time as it disseminates the attitudes necessary to sustain it.”1 In turn, the ritual actions of the people imitate the cyclical movements of the universe and maintain order in the terrestrial world, thereby “turning on” the meaning of spatially located symbols at appropriate moments.2 The layout of a ceremonial center and the ritual architecture within, then, is a reproduction of the cosmos, an “imitation of a celestial archetype.”3 Though it may seem like a contradiction, this representation of a seemingly eternal configuration of time and space was a dynamic arena that enabled transformations ranging from deep structural shifts in ideology to the expected machinations by rival elite factions vying for ritual-political power.

Power resides where men believe it resides.
—George R. R. Martin,
A Clash of Kings

Monumental Perceptions of the Tiwanaku Landscape

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Following Adam T. Smith’s call for the studies of political authority in and through landscape, this chapter highlights the dynamics of the monumental constructions of Tiwanaku and their strong relation to the landscape of the high Andes. Though nearly any site in the Andes can serve as a test case to demonstrate a relationship between the built environment and the landscape, the megalithic pre-Columbian ruins of Tiwanaku, Bolivia presents a long-lived and rare example of a primary polity that rose, matured, and collapsed without influence from a peer. Smith analyzes processes that show how natural and human-made landscapes participated in the formation of early complex polities by focusing on the Classic Maya, Urartian, and Mesopotamian cultures. These are the polities that left both archaeological and textual references, thus allowing different types of primary sources including, most importantly, an indigenous perspective on the creation of authority. Unfortunately for archaeologists, Tiwanaku is firmly entrenched within a preliterate tradition with little hope of any form of indigenous writing waiting to be discovered or recognized. The environment has been unkind to preservation, the looting during the colonial period was particularly fierce, and modern conservation efforts have been heavy handed. A related challenge is presenting these fragmentary remains in an objective fashion, followed by informed interpretations that go beyond simple description but stop well short of speculation. Yet, the highly sophisticated use of monumental form to alter and manipulate perceptions of sacred landscapes in the Andean Titicaca Basin provides an example of an innovative and rather non-Western method that early complex polities accrued power and created authority.

Configuring architecture and space along symbolic lines is a fundamental design principle of the Andean builders, a quality observable in their most modest and ephemeral structures as well as in the most complex and colossal ones. In a continent defined by the Andean mountain chain, snowcapped mountains, the perennial source of water in landscape characterized by extremes in weather, are frequently a visual and symbolic focus of site design. Taking care to distinguish primary contexts from these post-occupation disturbances, the core of the Tiwanaku site potentially holds an unadulterated legacy of monumental construction that spans from its modest beginnings around 300 BCE to its apogee between 500s and 950s CE.

This chapter begins with overviews of the geographic and cultural setting of the Titicaca Basin, where the sacred resides in the natural phenomena and a deep tradition of religious architecture developed in a near inverse method to Western traditions. Rather rather than focusing adoration within the area defined by the footprint of the building, the architecture is designed to project attention toward the distant horizon and sky. The well-preserved remains of
the earliest building at the site provides the opportunity to establish basic architectural canons while making the case that the historically documented belief in a sacred landscape is an appropriate analog to apply in this preliterate example. Thereafter, I describe qualities of the monuments relevant to the research of political landscapes, concluding each description with a claim as it relates to the intent and purpose of the building. This analysis is sufficient to give an idea of the three-dimensional form of the buildings, the likely flow of traffic, and locations designed to draw or focus attention. In effect, we can recreate, on a gross level, the structure of the experience that by itself provides enough information to venture into a discussion about the order of the events, composition of the audience, and, in general terms, construction of the message of the monuments. Over the thousand-year history of the site, we can note changes to this carefully design-structured experience and draw political implications on the methods and strategy that the Tiwanaku used to outcompete the hundreds of other small ritual sites to become the only monumental site in the basin worthy of being called a “capital.”

**THE DYNAMICS OF THE SACRED LANDSCAPE OF THE ANDES**

From state-level societies to the smallest village, the Andean sacred landscape is oriented around the fundamental unit of the **huaca** (or **wak’a**), the broad term used to designate a sacred place or object thought to be holy. Marked in the landscape by the construction of shrines, ritual pathways, **apachetas** (stone cairns), and toponyms, a **huaca** represents the node between the spiritual and the physical; **huacas** are portals through which offerings and prayers result in supernatural influence over human affairs. William Gustav Gartner has demonstrated the kinesthetic mapping of the Andean landscape as a dynamic social discourse whereby the **huacas** act as both the mythohistorical and physical expressions of a people’s link to their ancestors and consequent claim to their land.

The most powerful **huacas**—those deemed responsible for perpetuating cosmological order—had elaborate social and political institutions built around them. Among the most important **huacas** of the sacred landscape are prominent mountain peaks identified as **apu**, **achachila**, **malku**, or **wamani**. Reinhard’s extensive survey of mountain shrines in Peru and Bolivia indicates that mountain worship was a ubiquitous phenomenon in the Andes. Mountains were, and continue to be, venerated as sources of water, influential agents in weather and climate, symbols of fertility, and ancestral **paqarinas** (places of creation or origin). Offerings to the mountains could be made at quite a distance, at the base, or on the summit at altitudes that test the limit of human endurance.
traditional present-day ceremonies, the huacas are toasted by the revelers, starting with the local hills and outcrops and gradually expanding to include the regionally visible snowcapped mountain.\textsuperscript{15} The hierarchy of huacas can also be seen, for example, in the manner in which a theft from someone’s home may be redressed. The victim calls upon the primary mountain in the area for help, and the request is passed down the line from greater to lesser huacas until it reaches the spirit of the house, who divulges the culprit.\textsuperscript{16}

Another important and related component of the Andean sacred world is the sky. Ethnographic, ethnohistoric, and archaeological studies in the Andes illustrate the ubiquitous use of lunar, solar, and stellar observations to structure agricultural, pastoral, and ritual calendars\textsuperscript{17} and establish a system of cyclical time on earth and contextualized human experience in terms of days, months, and years. In precontact state-level societies, this cosmological knowledge was measured and celebrated with monumental constructions; less complex groups and the post-European-invasion Andean world maintained a similarly well-developed understanding of astronomy, but relied on natural landscape features as reference points to observe the astronomical bodies and to plan farming and herding accordingly.\textsuperscript{18}

Owing to the Spanish suppression of indigenous practices in public settings, the Inca capital of Cusco is the only case where we have extensive accounts of the native perspective on the place of the pre-Columbian city within their cosmological world.\textsuperscript{19} Spanish chroniclers recorded how the belief that Cuzco was both physically and spiritually the center of the world was conveyed in narrative, ritual, monumental buildings, and extensive landscape modifications.\textsuperscript{20} Various prepared plazas, fields, and elaborate buildings within the city and its immediate environs served as gathering points to observe important astronomical events along a horizon marked with monumental pillars. From the ritual center of the city radiated a pattern of imaginary lines that connected the sacred locations to the boundaries of the empire.\textsuperscript{21} Mythic and dynastic histories were recounted as the faithful walked these pathways and paid homage to the sacred sites that stood as both reminders and evidence of remarkable events in the creation of the world and in the divine founding on the Inca lineage.\textsuperscript{22}

**GEOPOLITICS OF THE TITICACA BASIN AND THE EMERGENCE OF TIWANAKU POLITY**

The rarefied air at 13,000 feet above sea level and the endless expanse of spiny grass challenge the present-day visitor to envisage the Titicaca Basin
as one of the wealthiest and most productive areas in the Andes during pre-Columbian times. Lengthy meandering caravans of llamas were the vehicle for a constant exchange of highland products, such as potatoes and dried meat, as well as those from more temperate zones, such as corn. As a result of this robust trading system, the Titicaca Basin cultures influenced a significant swath of the southern Andes from northwest Argentina to the coastal Valley of Moquegua, and from the desert of San Pedro de Atacama to the humid tropics of the Amazonian Basin (figure 5.1).

The central feature of the basin is Lake Titicaca, one of the natural wonders of the continent. Deep enough to merit the distinction of being the world’s highest navigable lake, its surface area is approximately 8,500 km². In addition to its natural beauty and extensive resources, Lake Titicaca figures high in the list of sacred places in the Andes from the pre-Columbian Period to the present. Early Spanish chroniclers based in the Inca capital of Cuzco recorded the official mythic history of the how the creator god Viracocha rose either

**Figure 5.1. Lake Titicaca and the extent of influence from the Tiwanaku polity.** (Redrawn from Stanish 2005)
from the Island of the Sun on Lake Titicaca or from the ruins of Tiwanaku.23 The offspring of Viracocha then founded Cuzco. Other versions of the myth highlight the Island of the Sun as the very birthplace of the sun.24 In addition to the lake-based mythology, many of the sacred mountains of the Andean mountain chain—Illimani, Illampu, Huayna Potosi, and Ccapia—are visible from southern portion of the basin (figure 5.2).

Around the period that agriculture was taking hold in the Fertile Crescent, bands of hunters whose ancestors had wandered across the Bering Strait from Asia to the Americas arrived and settled along the banks of the lake, taking advantage of its shoreline resources and temperate climate. By 2000 BC these settlers had created small communities, making a living by hunting, fishing, herding camelids, and farming small plots along the shores and the hillsides.
Occasionally one of these communities would build a public-space sunken court on top of a natural rise or a revetted platform. These sunken courts dot the landscape of the basin, but the lack of substantial infrastructure such as roads and fortresses, or of similarities in architectural form, or of a shared iconography have led to a consensus that these communities were not part of a larger organization such as a state, but participated in a shared religious tradition.

The first large sites that appear in the north of the basin—Pukara and Tarraco—coexisted until the former was apparently destroyed, after which the latter increased in monumentality and influence. In the later years of the Pukara phenomenon, a few locations in the southern basin appear to form the focal point of a larger network. The largest and most elaborate sunken court was built in a fairly nondescript area of the southern basin, 15 km from the shore. Over the next millennium, the other monumental sites in the southern basin would wither while some of the largest structures ever erected in the Andes would crowd around this sunken court and spread across the floor of the valley (figure 5.3). By the time that monumental constructions ended around AD 950, the iconic architecture and artifacts from Tiwanaku had found their way around the shores of the lake and to select locations of the southern Andes.

**TIWANAKU SITE AND POLITY**

Any description of the site of Tiwanaku must be tempered by the sober fact that all the monuments have suffered the constant ravages of time and human activities. A torrential amount of rain during the winters has long eroded the adobe walls that made up the majority of the site fabric. The stone remained, but their high quality made the monuments an attractive source of building material for Spanish-Period houses, churches, plazas, and bridges. An early Spanish chronicler, Bernabé Cobo, pointed out that quarrying the monuments for their astonishingly geometrically shaped ashlars was well under way when he passed through Tiwanaku in 1610, concluding wryly that if Tiwanaku were closer to a major Spanish settlement, not a single stone would remain.

Generations of plowing and grazing has smoothed over the spaces between and around the heavily looted monuments, so it comes as no surprise that early scholarship downplayed the presence of a resident population. In reaction to the claim of an empty or lightly populated site, Bolivian politician and anthropologist Ponce Sanginés proposed a sequence of development of Tiwanaku from 1600 BC as a modest set of hamlets to a large urban center around AD 600. In his model, Tiwanaku continued to grow as a large urban center for the
Figure 5.3. Tiwanaku-Period monuments. (Contours redrawn from Kolata 2003)
next half millennium, surpassing all other centers in the continent in size and strength. Other scholars have subsequently included Tiwanaku in the list of substantial pre-Hispanic urban centers whose power was based on tangible resources accumulated from a vibrant trade network, or on an innovative agricultural system that supported a large population involved in aspects of bureaucracy, ritual, and eventual conquest and control.

In recent years, the pendulum seems to be swinging away from this model of a densely occupied and hierarchical city. What had been a comfortable polemic a few years ago (densely occupied versus empty), has become a tangle of terminology as archaeologists attempt to invent a new term that captures the essence of a complex phenomenon with a single, memorable sound-bite. The term empty ceremonial center remains an unpopular, if not dangerous, term to use due its association with a biased past; however, using analogy to the rest of the modern and ancient world is possible, such as the archaic city-states of Greece and the Shogun palace fortresses of medieval Japan. The recent trend to invent novel terms such as hospitality state, pulsating ceremonial urbanism, and festival city highlight the idea that cyclical festivals, and a capacity to accommodate massive and temporary number of visitors, was a primary quality of the site.

The mechanism that resulted in the distribution of Tiwanaku architecture and artifacts across locations in the southern Andes is similarly a matter of contention. There are those who claim that the presence of Tiwanaku-style artifacts is primarily ritual or religious in nature, whereas others propose pilgrims and itinerant medicine men as disseminators of Tiwanaku-style artifacts. Notwithstanding, these ritual items may have been transported by religious intermediaries or commercially as part of the cargo of llama caravans that traveled the extensive road system. An unabashedly nationalistic perspective argues for the military and conquest-oriented nature of the Tiwanaku horizon, although as of late the more bellicose rhetoric has been tempered to reflect the activity of an organized state that did not exert the same level of control throughout its territory. The most recent and most commonly used topographical representation of the Tiwanaku polity without strictly defined linear borders replaced the previous polygonal form of the Tiwanaku “empire” traced with thick geometric lines (figure 5.1). Similar to other early complex societies, the area under direct control was not continuous. Therefore, though we probably know more about Tiwanaku than any other pre-Columbian site in the continent, research remains dynamic and fluid as scholars vie to understand the mechanism that directed the energies of diverse communities toward creating a singular awe-inspiring setting.
MONUMENTS OF TIWANAKU

Though in plan view the site of Tiwanaku recalls the foundation and linear growth of a master planned city, the development of the ritual core was a process of constant modifications that included razing older structures to provide ashlars for new buildings (figure 5.3). The continual building and rebuilding on the same site over a prolonged period of time is an indication of the importance of this location and the durability of Tiwanaku’s institutionalized apparatus.42 Our chronological control over the construction sequence is in need of more absolute dates, but for the purpose of this study, we do have sufficient material to create a relative building sequence.

The Semi-Subterranean Court, popularly known by the more manageable term as the temple, appears to be the earliest surviving structure and remained in use for nearly a millennium. Deep excavations in the vicinity have revealed glimpses of other early-period buildings, but for the most part later Tiwanaku constructions have buried or obscured the early period. The closest surviving monument both in terms of distance and age is the Kalasasaya platform. The radiocarbon dates for this 130-by-120-m platform are problematic, but eliminating the extreme dates leaves us with a broad range of AD 300–500.43 There are a few other structures that date toward the end of this period, including the Mollo Kontu, a low platform with a mortuary component 300 m south of the Kalasasaya. At a similar distance to the west is the Kherikala, a poorly preserved multiroom complex with an interior plaza space.44 Both monuments appear to have been abandoned prior to the dynamic period that included razing and resurfacing the core of both monumental and residential buildings. The Putuni platform, the Kantatallita Complex, and the towering 18-m-tall Akapana platform are built with stone reused from the previous incarnation of Tiwanaku.45

A kilometer to the southwest lies the Pumapunku Temple Complex, an alignment of plazas and ramps centered on a low but solidly built stepped platform.46 Built around AD 550, the Pumapunku was enlarged on several occasions but never completed. Though considered the apogee of Tiwanaku art and architecture, recent evidence suggests that the platform was abandoned and even looted of foundation deposits during the Tiwanaku Period.47

Further south along the gentle ridgeline of a natural lacustrine rise stands an undated monument known as Choquejacha, a natural spring modified by the addition of an andesite basin and canals. A similar fountain, now lost, was described in the late nineteenth century to the north of the present-day village of Tiwanaku.48 Two kilometers to the south, near the foot of the Quimsachata range, is Pokotia, a small, unexcavated platform built of stone and fill similar
to the Pumapunku platform. Undoubtedly, there are other structures waiting to be documented, not the least of which wait in the area underneath the modern town of Tiwanaku, where construction projects frequently churn up midden artifacts and substantial stone ashlars.

When the Inca armies arrived to the basin 500 years after the abandonment of Tiwanaku, they considered the Pumapunku to be the most important part of the site and subsequently repaired and embellished the platform. Besides placing an occasional offering at the other monuments, they appear to have paid little attention to the rest of the site. Similarly, or because of this, the initial descriptions by Spanish chroniclers considered the Pumapunku platform to be the focus of the ruins. Due to the heavy-handed reconstruction efforts in the late 1950s and the location of the present-day tourist road, the cluster of monuments that surround the temple is considered the site center. Though Tiwanaku monuments spread out along the distance of 3 km, this chapter concentrates on the temple and the monuments in its immediate environs since it presents a long and complex history of occupation and construction that serves the purpose of demonstrating the changing experience and interpretation of the sacred landscape and its political depths. Furthermore, the early-period temple remained intact while the rest of the site was built and rebuilt, leaving us with a unique opportunity to study in depth early architectural precepts.

THE TEMPLE

The form of the temple follows the general pattern of sunken courts, although its dimensions—28.47 m north-south, 26 m east-west, and 2 m deep—make it the largest example in the basin (Figure 5.4). The walls consist of fifty-seven large vertical pillars interspersed among smaller cut-stone and carved-tenoned heads. The heights of the pillars are variable; several peak over the elevation of the reconstructed wall. The pillars in the approximate center of the east and west walls (referred to as the Eastern and Western Iconographic Pillars) show evidence of the subtle remains of heavily eroded carved iconography. A black basalt stone slab, the only basalt stone built into the structure and possibly all of Tiwanaku, is set in the approximate center of the north wall; opposite this slab of basalt, on the south side of the temple, broad overlapping sandstone slabs form stairs that are framed on either side by the largest pillars in the structure. This monumental entrance is set a near-meter off center.

Standing at the Western Iconographic Pillar, the Eastern Iconographic Pillar marks the equinox sunrise. Switching viewing locations—that is, standing
at the Eastern Iconographic Pillar—the Western Iconographic Pillar marks the equinox sunset. Both pillars also mark the location from which one can watch the rising and setting of the bright stars Alpha and Beta Centauri within the pillars of the entrance. Any location within the templete would draw attention to the distant mountain of Quimsachata, which is perfectly framed by the pillars of the singular entrance. Notwithstanding, standing at that basalt stone on the north wall and looking down the centerline of the stairway toward the Quimsachata, an observer’s sightline would be slightly skewed eastward in contrast to the primary temple orientation (2°46’ west of south). The sightline orients to absolute south (0° deviation), placing the highest peak directly beneath the Southern Celestial Pole, the fixed cardinal pivot of the southern hemisphere.

The north and south walls are cardinally oriented (error of .4°), whereas the east-west walls are oriented 2° east of north or west of south. As is the case with other sunken courts throughout the basin, the south wall is slightly shorter than the north wall, resulting in a trapezoid shape. If one were to extend the orientation of the east and west walls, they would converge south in the direction of Quimsachata Mountain. To the west, the highest peak of
Ccapia coincides with the setting position of the winter solstice sun. While there does not appear to be any architecture marking this alignment, this mountain/astronomical alignment would only be appreciated with negligible variation (less than ½°) 122 m north and south of the temple. In the Tiwanaku Valley, which spans 15 km north-south, there is approximately a 2 percent ($P = 0.016$) chance that a randomly chosen location will result in this alignment. The Quimsachata/Southern Celestial Pole alignment would be appreciated by all within temple, and to a distance of 210 mon either side. Based on the E-W (32 km) dimensions of the Tiwanaku Valley, there is roughly a 1 percent ($P = 0.012$) chance that a randomly chosen location would result in the alignment. Combining the probability of the Quimsachata/Southern Pole and the Ccapia/winter solstice alignment, the location of the temple and its architectural form was based on properly viewing these two landscape/astronomical alignments.

The location of the site and the placement of specific architectural elements support the proposition that this and other sunken courts formed part of a larger web of ritual sites and landscape alignments. To the west, the Ccapia/winter solstice sunset alignment passes through the site of Iwawe, a substantial site occupied from the Formative Period through the Middle Horizon, acting during the apogee of Tiwanaku as the landing point for the ritually important andesite stone rafted from across the lake from the Ccapia quarries. There are other locations closer to Tiwanaku where these blocks could have been deposited. Based on analog with the ritual pathways walked during the Inca Empire, this location was likely chosen to transport these ritually important stones along the alignment marked by the Tiwanaku–Ccapia/winter solstice sunset alignment.

Standing at the north wall of the temple and facing south, the alignment projected from the central north-south axis of the temple extends directly through the middle of the solitary and distant Pokotia platform. Shifting slightly over to the black basalt stone a sightline is projected that bypasses the Pokotia platform by 120 m but passes directly over the peak of the Quimsachata and directly under the Southern Pole. Continuing over the Quimsachata peak and into the Valley of Jesus de Machaca is the large and elaborate Formative-Period site of Khonko Wankane, similarly featuring a sunken court with a south-facing entrance with flanking pillars framing the permanently ice-clad and historically sacred Sajama Mountain. Tiwanaku, the highest peak of Quimsachata (midpoint), and Khonko Wankane all share the same longitude (68° 40' 21", +/− 1°), that is, directly north south. The combined error is less than 60 m across 28 km of mountainous terrain, an achievement that implies a high-degree of planning and foresight in the construction.
of both these centers. Additional research would be necessary to confirm if these alignments were meant to be both observed and walked, similar to the Inca processions along the ceques lines dotted with huacas.

We can propose a series of early architectural rules based on this singular example:

1. Site location is determined by the visibility of sacred mountains concurring with the cyclical movements of astronomical bodies.
2. Building form—geometric but intentionally not symmetrical—was a result of aligning paired walls to landscape features and astronomical bodies.
3. Pillars, either single or in combination, serve as reference points to observe, measure, and frame important astronomical objects and landscape features. The backsite (the location from where one would view the alignment) is marked with a unique architectural element. The placement of both these elements could compromise the building proportions in a manner nearly indistinguishable by casual observation.

**CONSTRUCTION, CIRCULATION PATHS, DESIGN, AND EXPERIENCE OF TIWANAKU**

The surviving monuments that postdate the temple demonstrate an evolving preference toward stepped platforms set within larger complexes. Certain design elements and orientations remained consistent, and the style of masonry remains recognizably similar over a thousand years, albeit at a larger and more elaborate scale. These monuments have been described, measured, drawn, and photographed innumerable times over the last five hundred years. In the following section I select four separate qualities of the monuments—construction, circulation paths, design, and experience—as the means to describe and measure the changes in ritual space, as Tiwanaku developed into the only monumental site in the basin.

**Construction**

The quality of the stonework of Tiwanaku has been a source of speculation and detailed scholarly analysis, as well as general amazement. This fascination with the stonework has overshadowed one of the more impressive engineering accomplishments of the Tiwanaku, which is the use of fill and retaining walls to create geomorphically stable freestanding platforms in a region that receives a torrential amount of rain during the winter months.
From the ground perspective, the Tiwanaku platforms are astoundingly monumental. A system of multiple retaining walls and façades protect the precise joints of the final retaining wall (the façade) from the static-load pressures of the thousands of cubic meters of fill. Viewed in a cross section, the stone revetments appear to be a thin skin over a mass of fill (figure 5.5). The interior construction method is best documented at the Pumapunku, where we noted three types of fills: an interior of solid clay core; a compact fill reinforced with cobbles that supports the stone revetments; and even layers of sand that were so compacted that stress marks were visible in each layer. The interior and exterior fills overlap, functionally grading the more stress-prone areas. Layering, leveling, and compacting the fill into thin layers seems like a laborious construction process, but this inventive technique resulted in the division of the fill into horizontal compartments. These compartments reduced the chance that the platform might suffer the drawbacks of a single mass construction, specifically the development of particular symptoms of geomorphic slump. The summit is divided into separate surfaces, each slightly inclined and serviced by its own hydraulic system; as a result, there is less danger of damage from the accumulation of water.

This brief review of construction fill and form brings us to our first point about the great care which was taken to create geomorphically stable platforms that would not slump under their own static loads, nor would they threaten the stability of the heavy summit structures used as markers in naked-eye astronomical observations. In contrast to the encased platforms and pyramids of the North Coast of Peru or the tell mounds of the Middle East that grew in a cumulative fashion, the basic footprint and form of the Tiwanaku platform was decided from the start, requiring a substantial investment of effort before they could be used even in a partially unfinished state.

**Figure 5.5. Cross sections of the Kalasasaya and Akapana platforms.**
Circulation Paths

The summit and interior spaces, once targeted by looters looking for treasure and building material, were until recently under cultivation. Excavations in these contexts are a thankless task of shifting through looters’ fill before hitting a partially preserved surface devoid of any artifacts. The Kalasasaya and Putuni Complex was excavated in its entirety in the previous decades and readily renders a comprehensible layout of the surface of the platform. A plan view and three-dimensional model of the Kalasasaya–Putuni Complex is based on the laser-transit measurements of the extant remains combined with virtual forms I recreated from the notes, photographs, and maps from the last century and a half (figure 5.6). Local informants pointed out authentic remains from recent additions and traced out the location and dimensions of missing architecture. For all its limitation, this is the best spatial understanding we have of one section of the core of the site. In terms of layout and design, the Kalasasaya and Putuni platforms are quite similar in the following ways (figure 5.6a). (1) They have stepped platforms revetted with stone. The material and joint fit of the masonry vary from one side of the platform to the other. (2) An inner courtyard was made of tightly fitted andesite ashls with inset chambers (fourteen total). Special structures purposed for astronomical observations were similarly made with andesite. (3) To the north and south of the courtyard are wall spaces that I refer to as flanks. (4) To the west of the courtyard is a wide raised space. (5) A monumental point of access on the east side of the platform leads to the inner courtyard. (6) Raised walkways, passageways, and freestanding buildings abut the exterior east side of the platform. (7) Several other less visible points of access were built against or into the platform.

The width of the passageways, type of stone used, and wear on the treads of the stairs indicate that the monumental space enabled the movement of large numbers of people to and from a centrally and monumentally defined space (Group 1), and timely and efficient movement of two smaller groups around the other sides and front of the platform (Groups 2 and 3). Group 1, then, consisted of the general population who would have entered through the most monumental entrance to the andesite-clad courtyard space; Group 2 would have been made up of second group moving around the edges of the platform through small corridors and stairs made of poorly fitted ashls; and Group 3 would have had access to the elevated space over the courtyard.

The pervasive use of the term pyramid for several of the monuments is a recent terminological addition likely chosen for its associations to the hierarchical states of the Nile River Valley and Central America. This common misconception
about Tiwanaku “pyramids” leads to our next claim that *Tiwanaku platforms in concept and construction raised stepped plazas*. Unlike the aforementioned examples, whose summit spaces were tapered to small or nonexistent spaces, the summit spaces of the Tiwanaku platforms are expansive, contain multiple points of access, and could accommodate a large number of people.
The importance of Quimsachata Mountain for the design of Tiwanaku is made apparent by the visual alignment formed by the pillars defining the south-facing entrance to the templete; over the next millennium, the Tiwanaku continue to reaffirm the ritual centrality of the Quimsachata and Southern Pole in both subtle and obvious methods. For example, the alignment of the east and west walls of the monuments vary ever so slightly to create a nearly imperceptive radial form converging on the peak of Quimsachata. In a more obvious fashion, the entire mass of the Akapana Platform shares the same orientation as the templete (2°46’ west of south), and thus would also be aligned to the Quimsachata/Southern Pole confluence.

For the monuments constructed after the templete and before or during the Akapana platform, the daily path of the sun and its incremental journey along the horizon from solstice to solstice become a major influence in design. The construction of the Kalasasaya signals a critical shift from sunken temples decorated with underworld images and keyed to celestial movements of the nighttime sky, to raised platforms aligned east-west with architectural and iconographic reference to sacred mountains and the passage of the sun. The primary entrance is located on the east side, offset 2 m north of center, and aligns to the position where the sun first becomes visible at equinox; the large megalithic pillars at the platform’s southeast and northeast corners mark the locations where the solstice sunrises would first appear over the eastern mountain range. Eleven upright andesite orthostats project over the height of the west side of the Kalasasaya, and mark the setting sun at solstices, equinoxes, and other incremental divisions of the solar year, representing a unique and sophisticated system of horizon-related astronomy.

At first glance, the geometric form of the Tiwanaku site appears to be similar to that of the grid form that ordered many Old World planned cities. However, it is more likely that similar forms result from convergent and quite different architectural purposes, processes, and methods of design. In addition to an order based on alignments to natural and astronomical bodies, Tiwanaku design displays an Andean tendency toward radial space. For example, the gateways of the Kalasasaya, the templete, and Kantatatallita—three critical monuments that span a near millennium of construction—are connected along winter-solstice sun alignment. To the west this alignment passes through the aforementioned site of Iwawe, but closer to the site, the alignment passes over an early colonial church in the town of Tiwanaku that, according to several sources, was built over an important pre-Colombian structure.
The extensive literature on geometric and astronomical alignments of Tiwanaku constructions is a time-consuming path overgrown with mathematical opacity and rampant speculations. The alignments presented here were personally confirmed using established archaeoastronomical methods. Clearly, more important alignments need to be described, considering the complexity of the horizon, evidence of Andean knowledge of astronomy, and the amount of unanalyzed architecture in the area. These few confirmed observations are sufficient to highlight the next point that with the increased architectural congestion, the three-dimensional form of the buildings and their placement were based on the visual relations between the buildings and the natural landscape. Design was no longer based on a one-to-one relationship between architecture and landscape as was the case with the singular temple. Such complex design resulted in different experiences of the created landscape.

Experience

A small point of contention among specialists of religious architecture is whether design prioritized the view from above (for the benefit of divine beings) or from the ground (for the lowly mortal). In reality, both design qualities can exist at the same time and place. For example, the primary east-facing doorway breaks with the precise symmetry of the Kalasasaya to appear, from the perspective of someone standing in the center of the platform, to align with the rising sun at equinox. It would be unlikely that the viewer would notice this 2 m adjustment over the 120 m width of the platform.

The temple originally framed the Quimsachata between its flanking pillars. Slightly over a hundred meters to the west and a near millennium later, the Quimsachata and Southern Pole configuration is similarly designed as an experience into the passage from the Kalasasaya to the Putuni platform. The main entrance of the Putuni—a monumental gateway of andesite blocks set on a solid platform of slabs of sandstone—would have been approached along a corridor formed by the space between both platforms. Either side of this space is defined by one of the most impressive examples of stonework in the pre-Columbian Andes: along the Kalasasaya side eleven andesite orthostats are interspersed between horizontal coursing of accurately fitted ashlers. Along the side of the Putuni, reused deep gray andesite ashlers have been reworked to fit with precision; adobe walls set on a row of stones would have blocked from view the unsightly sides of the platform made with casually fitted reused stone and riddled with narrow passageways. The corridor space between the Kalasasaya and the Putuni is oriented 0° south and thus places the Southern Pole directly above the peak of the Quimsachata. Such a setting
can be compared to an architectural canyon formed by the high walls of skyscrapers that have the undesirable effect of blocking sunlight and views of the landscape. In a similar fashion, the high walls of this canyon block views to the east and west, presenting the Quimsachata and Southern Pole configuration as the only visible and privileged landscape feature (figure 5.7).

The experience and the type of information one could draw during the winter-solstice sunset alignment would have depended upon where one stood (figure 5.6b). From east to west, increasing numbers of people could have viewed it as follows. Within the Kalasasaya, a single observer (A in figure 5.6B) standing on the central platform could note with accuracy the spatial and calendric relationship of the sun to the andesite pillars along the west side. Several more individuals (B) could gather in the courtyard on the east portion of the Kalasasaya and see the sun set over the large northwest pillar of the platform. A small group (C) immediately outside of the Kalasasaya platform could see the sun set within the Eastern Gateway, and a progressively larger crowd standing further east, toward the Kantatallita
Complex, could see the sun appear to descend into the platform and set behind the Ccapia volcano.

As the sun drops below the horizon, the shadow of the Kalasasaya engulfs the temple and the area beyond, but the narrow opening of the Eastern Gateway allows a slender shaft of light to shine through. The shaft of light appears to travel across the southwest corner of entrances of the temple and continues directly to the monumental entrance of the Kantatallita Complex. The few standing along the pathway of the light would see the beam advance toward them before seeing the sun inside the gateway. To those surrounding this narrow field of view the effect was like a natural spotlight, illuminating an individual in the midst of a shadow cast by the platform. Metal plates and other jewelry could have increased the effect; in fact, the remarkable metallurgical traditional of the Tiwanaku was driven by the desire to increase and vary the luminosity of naturally occurring metals mined from the nearby Quimsachata range.

The final moments of this scenario—an individual covered in metal that is illuminated by the final rays of the sun—are plausible but strictly hypothetical; excavations along one point of this path of light uncovered a burial of sacrificed individuals complete with elaborately decorated serving vessels and other offerings. Based on this chance find, it would seem reasonable to propose that this shaft of light was celebrated in a dramatic fashion. This interplay of light and architecture highlights the final point, which is that the design of Tiwanaku also took into account the perspective and experience of the viewer. In addition to design form based on alignments with landscape features to form surprisingly geometric forms, other variables—time, movement, and vision—were important considerations in design.

DISCUSSION: THE PERCEPTION AND VISION OF TIWANAKU RITUAL-POLITICAL LANDSCAPE

From the archaeoastronomical analysis of the temple, the site location was based on appreciating the dual view of the Quimsachata/Southern Pole and the Ccapia/winter solstice sunset. At least five major monuments were built close enough to the temple to fall within the dual mountain/astrophysical viewsheds over the next millennium, increasing the number of spectators and diversifying the opportunities and means to experience space on multiple scales in this intentionally constructed visual relation between architecture, landscape, and cosmos. The primary sacred mountains of the basin could be experienced in the most spectacular manner from a Tiwanaku-built setting,
reflecting, perchance, the aspiration to become the primary location for all mountain worship in the Titicaca Basin. The larger and grander the huacas—snowcapped mountains in this case—the more elaborate the monument would have to be to outdo other challenges to its sacred power.\textsuperscript{69} Ritual capturing these mountains would direct the flow of pilgrims and offerings to the site rather than to many other ritual sites in the basin; furthermore, and if the modern analog of mountain worship applies to this period, the result of gaining the most important mountain huacas would also have the effect of capturing the adoration and related offerings of the related subordinate mountains.

Monumental architecture is often constitutive of negotiations over political power and legitimacy.\textsuperscript{70} On some level monumental architecture can make claims well beyond the actual accomplishments of the society that built it; like the proverbial bully who strikes out at others as a result of a deep insecurity, archaeologists debate whether heightened periods of monumental construction reflect a confidence of power or an inherent instability. We know little what the Tiwanaku thought of themselves; there are no representations of rulers inscribed with their claims of divine ancestry and extraordinary accomplishments. Nevertheless, even in this shattered state, without all the niceties that would have graced the summits and tops of the ubiquitous orthostats, we have the remains of an architectural narrative of a political and ritual preeminence as ancient and immutable as creation. Several scholars suggest that the survival of the temple was a method to present a claim to antiquity, similar to the manner that other capitals would preserve (or manufacture) a location associated with the original founder(s) of the city.\textsuperscript{71} The worn sandstone of the stairs and the eroded blocks defining the interior walls would have been enough to legitimately claim a deep connection with a mythic past. However, in typical Tiwanaku form, this claim to antiquity was projected well outside the 27 m by 28 m dimensions of the temple. The original view from the temple, circa 300 BC, was an encirclement of pillars marking the natural landscape and sky (figure 5.4). After a millennium of construction, the view of the landscape and sky has dramatically changed. To the east, the summer solstice rises from the Kantatallita Complex.\textsuperscript{72} Through the flanking pillars of the larger entrance, the Akapana platform blocks the view of the Quimsachata and crowns its summit with the Southern Pole (figure 5.8). To the west, the Kalasasaya creates an architectural horizon, thus marking the entire cycle of the setting sun with its mass. Instead of a natural distant horizon, then, human-made mountains and horizons measure the immutable cycles of the heavens. From the perspective of the temple, the surrounding monuments are the landscape, and they would be imbued with both the immutable and sacred
aspect of the landscape and sky. Through this strategic placement of monuments, the Tiwanaku edited a landscape narrative of creation and the cycles of life and placed themselves firmly at the center of that story.

CONCLUSION

The primary ritual and public spaces at Tiwanaku were plazas or courtyards that held sacred idols and were the controlled setting for choreographic interactions with high status and important residents. These plazas were both conceptually and experientially very different from the Western counterparts of the plaza. The Tiwanaku platforms had a panoptical quality, but rather than placing its residents or visitors under scrutiny, it fixed the surrounding landscape under its gaze. This spatial and visual effect was fashioned by either dropping the floor deeply into the ground until the surrounding ground surface fell from view as in the sunken templete or, as in the case of the Kalasasaya and Akapana, by raising a large broad surface and encircling it with pillars and gateways that would

Figure 5.8. Idealized view of the southern horizon from inside the tempalte. The monuments are superimposed on the horizon, the locations of the winter solstice sunrise and sunset, and the rotation of the Milky Way around the Southern Pole.
frame or create visual points of reference for landscape features and astronomical bodies. The solid construction of the platform could receive the weight of the heavy andesite superstructures without any resulting settling or geomorphic movement, preserving their impressive precision in fit and their precise alignment toward sacred locations and specifically timed astronomical events.

Like any capital of a large polity, Tiwanaku would grow in monumentality, but not in the same form as an expansionist and tribute-based Rome or a Nineveh, where a concentration of the spoils of conquest and taxation would transform the streets from dirt to stone and replace the modest homes of the general populace with the palaces of the powerful. Even once gaining supremacy, a nonliterate but highly sophisticated culture like Tiwanaku would have to constantly reinforce its sacred claims by designing greater and more elaborate settings in an obvious and almost visceral manner. The layout, distribution, and the apparent need to constantly build and modify the monuments is thus the product of a ritual strategy to attract the attention of ethnically and socially diverse groups who resided across a geographically large outlying area, each with its own mythic history and ritual life, and to indoctrinate them within a single unified framework.

NOTES

5. Ibid., 112–270.
6. Ibid., 32–33, also emphasizes the promise of archaeology to reveal history situated in and developed in space.


21. See chapter 6 on Cusco by Christie in this volume.


42. See also Smith, *Political Landscape*, 238–270.

Inquiry (Washington, DC: Chesham: Smithsonian Institution; Combined Academic, 2003), 2:30–94, compiled and evaluated all the C14 dates for the site of Tiwanaku. While recognizing the difficulties of the excavation methods, dating, and reporting of the excavations through the interior fill of the Kalasasaya conducted by Cordero Miranda and Ponce Sangines, Janusek places the construction of the Kalasasaya platform between AD 300 and 500.

44. Nicole Couture, “The Construction of Power: Monumental Space and Elite Residence at Tiwanaku, Bolivia” (PhD diss, University of Chicago, 2002).

45. Although many of the radiocarbon dates of human and animal bones related to the Akapana have large standard deviations, the median dates allow us to propose a date for the construction of Akapana in the late sixth or first half of the seventh century. See Janusek, “Vessels, Time and Society: Towards a Ceramic Chronology in the Tiwanaku Heartland,” 2:30–94, Table 3.1; Linda Manzanilla, Akapana: Una Pirámide en el Centro del Mundo (México: Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México, 1992), 42–45, Fig. 13.


50. Using a theodolite equipped with a solar filter and the standard field procedure outlined by Anthony F. Aveni, Skywatchers (Austin, TX: University of Texas Press, 2001), and Clive Ruggles, Astronomy in Prehistoric Britain and Ireland (New Haven, CT: Yale University Press, 1999), we set about precisely measuring architectural features and their relationship to each other and to natural features. The lamentable condition of the site presents a related challenge. Centuries of looting have stripped off the façades and even taken many monuments right down to the internal retaining walls that held back the platform fill; A. Vranich, “La Pirámide de Akapana: Reconocerando el Centro Monumental de Tiwanaku” [“The Akapana Pyramid: Reconsidering Tiwanaku’s Monumental Center”], in Huari y Tiwanaku: Modelos vs. Evidencias, ed. P. Kaulicke and W. H. Isbell, Boletín de Arqueología 5 (Lima: Fondo Editorial de la Pontificia Universidad Católica del Perú, 2001), 295–308. Subsequent reconstruction work and ad hoc conservation efforts have over the years obscured much evidence...
about the original forms of the structures. Our study relies on several techniques to deal with the problem of disturbed remains. First and foremost, we have purposefully limited this study's scope, concentrating on the orientations of the exterior walls and certain stable architectural elements such as upright pillars and stairways, the size and unique form of which made them unattractive to looters quarrying for stone. We consistently measure the orientation of the monuments by taking multiple readings along a line established 1 m distant from the base of any retaining wall or façade in question. Our historical research and our interviews with long-term residents and earlier excavators have helped us to relocate lost architecture and to differentiate new elements from original features.


52. During the Late Formative Period the heliacal rise and set of the Yacana constellation occurred at the beginning and end of the rainy season.

53. Unlike the northern hemisphere, where the bright Polaris marks the Northern Celestial Pole, the southern hemisphere does not have a pole star. Ethnohistoric and ethnographic research, however, documents that there was intense interest among historic Andean peoples focusing on the fact that the stars and constellations traveled in a circle around the fixed point of the Southern Celestial Pole; Benitez, “What Would the Celebrants See? Sky, Landscape, and Settlement Planning in the Late Formative Southern Titicaca Basin,” in Advances in Titicaca Basin Archaeology II, ed. Alexei Vranich and Abigail Levine (Los Angeles: Cotsen Institute of Archaeology Press, University of California, Los Angeles, 2013).

54. See chapter 6 on Cusco by Christie in this volume.


56. The random probability of the Khonko-Tiwanaku-Quimsachata-Celestial pole alignment is a virtual 0%.

57. See chapter 6 on Cusco by Christie in this volume.

58. The proper term for a large stone interspersed between smaller stones should be **orthostat**. For the sake of simplicity, I use the more common though not completely architecturally correct term **pillar**.


60. Adolf Bandelier’s 1894 map, Max Uhle’s 1893 photographs, the lifetime collection of Arthur Posnansky’s photographs, and Cordero’s Mirandas meticulous notes,
measurements, and systematic photographs from the 1950s and 1960s were the basis for virtually modeling and incorporating missing architecture.


62. Analogy can be made to the Inca Empire and to other historically documented contemporary indigenous populations, for which such horizon astronomy established the basis for complex calendric and mathematical computations. See, for example, Aveni, Horizon Astronomy, 305–318; Dearborn, Seddon, and Bauer, The Sanctuary of Titicaca, 240–258; Zuiderma, “Catachillay,” 203–209; Mariusz S. Ziólkowski, “El Calendario Metropolitano Inca,” in Time and Calendarcs in the Inca Empire, BAR International Series (Oxford: British Archaeological Reports, 1989), 129–167; Urton, At the Crossroads of the Earth and Sky, passim; Benitez, “Descendants of the Sun: Calendars, Myth and the Tiwanaku State,” 49–82.

63. By the time the rising sun is visible over the uneven mountain range, it has moved slightly north in its daily path across the sky.

64. According my reading of Cieza de León, who visited the site in 1549, this wall was the place where the Incas masons tried to replicate Tiwanaku masonry for their own religious and regal buildings.

65. The intended effect of Tiwanaku stonework, according to architect Pierre Protzen, is to erase the joints between the stones and create a single surface.

66. While the reconstruction of the Eastern Gateway of the Kalasasaya has been justifiably criticized by architects and conservators, the width of the reconstruction’s opening is true to the original remains as uncovered in 1903 and published by Arthur Posnansky in his 1945 Tihuanacu, the Cradle of American Man (Locust Valley, NY: J. J. Augustin, 1945).


69. Salomon, Urioste, and Avila, The Huarochirí Manuscript, passim.

70. Smith, Political Landscape, 270.

71. Ibid., 206. See also chapters 2 by Kalas, 3 by Bogdanović, 4 by Rod-ari, 6 by Christie, 9 by Pilat, and 10 by Grigor in this volume.

72. In Aymara, Kantatallia means “place where the sun rises.”
