

## Sighting the apu: A GIS Analysis of Wari Imperialism and the Worship of Mountain Peaks

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### **Abstract:**

In the Andes, prominent mountains are revered as earthly spirits that protect, but may also punish, their human constituents. These *apu* were often linked to distant ancestors and are considered the most important local deities. During the phase of the earliest highland Andean expansive states (ad 600–1000), the Wari and Tiwanaku utilized mountain worship as a means of establishing hegemony over local peoples who considered these mountains as places of ancestral origins. By usurping the *apu*, or including them in the pantheon of imperial deities, the expansive state effectively held these sacred places hostage and incorporated local belief systems into an imperial ideology. Recent research has yielded new clues to the worship of mountain peaks, including the usurpation of a unique geological mesa formation at Cerro Baúl as the basis for the Wari colonization of its southern frontier. Furthermore, research on the mountain summit has revealed architectural complexes oriented to, and presumably dedicated for, rites of veneration to the higher snowcapped volcanic peaks visible from this mountain summit.

**Keywords:** cognitive landscapes | architecture | state ideology | GIS viewshed analysis | Peru | Tiwanaku | archaeology

### **Article:**

#### Introduction

In the ancient world, early expansive states utilized various means to exert their influence over far-flung territories. Militarism and economic coercion were certainly important forces in power strategies. Religion has also played a pivotal role in the expansion of early states. In the Andes, a landscape of topographic diversity, mountain peaks were imbued with great sacred power. Many of these peaks continue to be revered today. Usurping the power of these sacred peaks was a prime concern of early Andean states, and the integration of mountain deities into an imperial pantheon was a principal goal of early state administrators.

The early Wari state (ad 600–1000) was one of the most successful expansive polities in South America. At its height, it held sway over 1300 kilometres of the Andean sierra from Viracochapampa to Moquegua ( Fig. 1). Its southern frontier intersected with its rival, the

Tiwanaku, in the Moquegua Valley. Here, the Wari established a grand bastion atop the massif of Cerro Baúl (2590 masl). They built opulent palaces and temples on the flat summit of the mesa that we have argued served as a sort of embassy with the cultures of the southern realm (Moseley et al. 2005; Williams 2001).

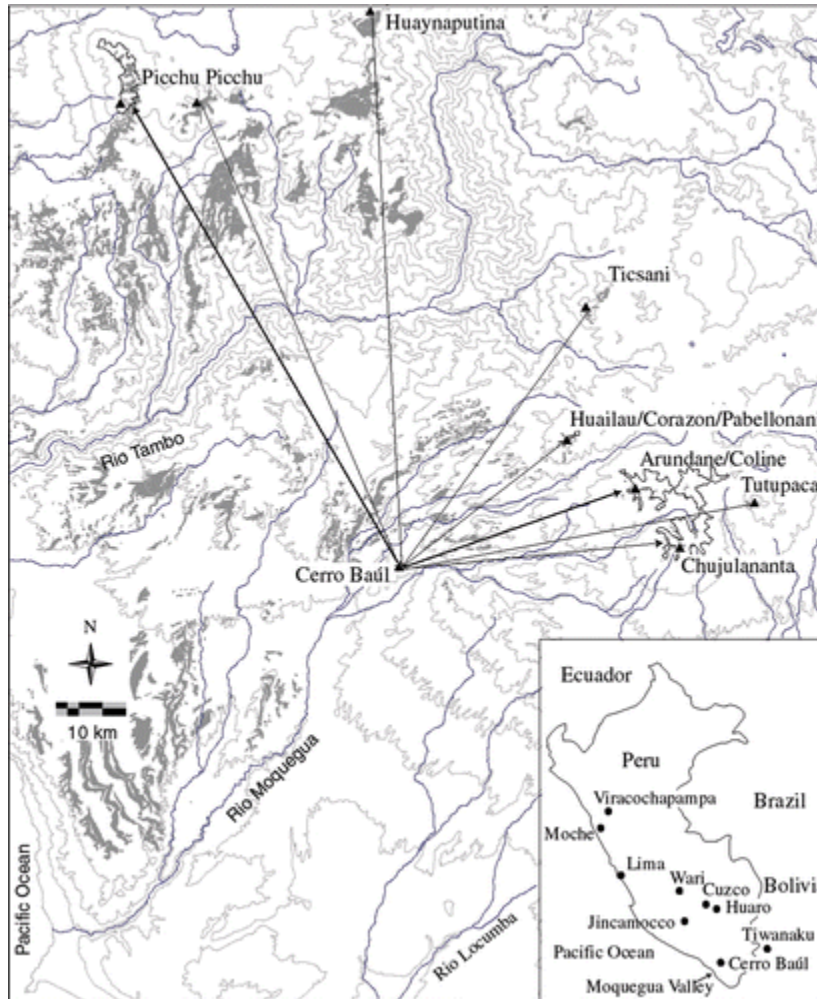


Figure 1 Viewshed map from Cerro Baúl. Grey shading indicates the area visible from the eastern summit of the mesa. Triangles are peaks over 5000m calculated as visible from the summit. Bold lines indicate the dominant features visible from Cerro Baúl.

A mountaintop, away from all natural sources of water and food production, seems an improbable choice as the location of an imperial centre. Defensive concerns were certainly met by such a location. The massive cliff faces could repel any frontal attack with just a few defenders. Religious concerns are likely to have been as important, however. Locating an imperial centre on the massif may have been a statement of religious power itself. Perhaps as important is the link between the mesa summit and the distant snowcapped peaks visible only from its summit. This visual link is reified in architectural complexes inextricably oriented towards these distant apu, or sacred mountains.

In this paper we review the importance of mountains as ancestral spirits in Andean societies. We then examine Wari expansion in relation to the incorporation of these mountains into administrative ritual. Finally, we turn to the southern frontier of the Wari realm and investigate the role that specific mountain deities may have played in the Wari strategy of incorporation based on both modern ethnographic data of mountain worship and GIS-based viewshed analyses of apu sighting. We also examine the construction and orientation of ancient ritual architecture as evidence for a cult of the apu during Wari times at Cerro Baúl.

### Mountain worship in Andean societies

Snow-capped peaks are revered and venerated in many modern highland Andean communities. Apu (Bolin 1998; Gose 1986), wamani (Isbell 1978) or jach'arana (Rasnake 1986, 1988), as they are variously called, serve as important members of indigenous communities. At times they are considered parental figures or ancestors (Anders 1986; Favre 1967) and by others as guardians or benefactors (Rasnake 1986). Regardless of the relations described, the supernatural forces residing in these alpine environments are focuses of ritual performance, whether the rite is conducted on the snow's edge as a supra-regional pilgrimage (Allen 1988), or the spirit is called to attend hearthside family services (Bolin 1998), or ritual payments are made in specialized communal locations, where surrogate altars or stone boxes pertain to specific familial groups and receive offerings sent via burning or burial (Isbell 1978).

Even if these dramatic features cannot be seen from every location of a settlement and its associated chacras (fields) and pastures, the members of different locales are ever aware of the spirits' oversight and the potential for good fortune or bad luck (Bolin 1998; Isbell 1978). These landscape animates are called by name as people traverse narrow passes or engage in productive activities. These entreaties may be associated with symbolic acts such as blowing on coca leaves or entail a series of ritualized performances accompanied by a prescribed payment, or pagapu (Bolin 1998; Isbell 1978).

In its various forms, veneration of supernatural mountain personalities is deeply embedded in the structural framework of Andean worldviews and plays an important role in defining nested groups of kinship, community affiliation and larger regional identities (Rasnake 1986; Eade and Sallnow 1991). Apu are the owners of plants and animals (Isbell 1978) and must be fed to maintain the fertility of crops, herds and people (Bolin 1998). Today, apu are appeased by annual meals in February and August, but their dates, occasions and composition vary between highland groups, and may also differ between different spirits that have complementary responsibilities and corresponding preferences.

Within a region, mountain peaks are ranked and form a hierarchy. The spirits hold positions within the mytho-political order based on the relative height of their lofty abodes. Highland lakes and mountain peaks communicate with one another between regions. The higher-ranked entities give orders to their subordinates for the management of resources throughout the natural

landscape (Earls 1969; Gose 1986; Isbell 1978). These features can be masculine or feminine in association and can be grouped as mates or have sibling relations (Sallnow 1991).

The different apu have herds of their own that may parallel the holdings of their peasant devotees. They may also hold great wealth in gold, silver and copper. In fact, Rasnake (1988: 235) reports that the Yura people of Bolivia believe that the mountain spirits of the region replenish the mines of Potosi by nightly sending caravans of vicuñas loaded with silver. In relation to agricultural activities, the mountain spirits are the important providers of water. Offerings often include chicha and or cane alcohol. Drinking in turn, the participants of annual payments may start with Pachamama (earth mother) then toast each regional apu according to their rank. In many instances, ethnographers describe these libations being offered from seashells, objects that are related to the sea and the request for water (Murra 1975). Humans thus replenish the liquid of the mountain spirit in an act of reciprocity for the agricultural fertility that results from the mountain's liquid (Gose 1986; Harris 1982).

Mountain spirits can bestow gifts upon their adherents if proper restitution and offerings are made. Families that fail to feed the hungry mountain spirits may lose livestock or even family members. If offerings are wanting or ritual protocols are not performed correctly, the apu may express its displeasure in a number of ways (Bolin 1998). These spirits are considered ill-tempered and are easily vexed. Apu are often associated with condors, a highland predatory bird that has been known to carry off younger animals and feed on their hearts. Displeased apu may seek their revenge by sending such predators, withholding water or sending stormy conditions. To a degree, these entities are venerated out of fear.

#### Apu in the Prehispanic Andes

In the ancient Andes many of these patterns are apparent in the archaeological record. The veneration of mountain peaks may date back as far as the Initial Period (2000–900 bc). According to Carlos Williams, it seems that early coastal U-shaped centres turned their backs on the sea and faced up river towards the important source of irrigation water (Moseley 2001; Williams 1985). During later periods (c. ad 500), Moche ceramic vessels model mountain peaks as scenes of human sacrifice in which the long hair from the victim's head flows downward in front of the body descending the peak's slope (see Aimi 2003: 218–19, figures 187, 188). Alan Kolata (1993) has suggested that, at the site of Tiwanaku, located near Lake Titicaca, the Akapana, one of the site's principal pyramidal monuments, was modelled as a sacred peak. Excavations conducted in the 1980s demonstrated that canals allowed for the ritual manipulation of water at the Akapana and this activity was the primary focus of ritual performance during the early phase of use.

In Inka times (c. ad 1500), mountains were offered child sacrifices. Many of these elaborate burials have recently been recovered from mountaintop sanctuary complexes in southern Peru, Chile, and Argentina. Some of these interments and the associated ritual performances, called

capac hucha, may have been conducted to ask the mountain for needed irrigation water or may have been associated with claiming legitimate rule over a region and its resources (Anders 1986; Zuidema 1978, 1982). In many cases, the individuals are well preserved, dressed in rich textiles and accompanied by a suite of uniform grave goods including gold and silver figurines, objects of Spondylus and finely crafted ceramic vessels, all of Inka Imperial style (McEwan and Van de Guchte 1992). These Inka-sponsored offerings were a way for the empire to claim control of the mountain's contingent resources. Thus these rituals were a strategic way to claim resources in conquered areas and to legitimize their control of water and landscape modification – as intermediaries with these important chthonic entities (Zuidema 1982).

### Wari expansion and mountain gods

Having reached pinnacle elaboration during Inka times, mountain veneration goes back to the Early Formative Period (c. 1600–800 bc) in the Cuzco region (Zapata 1998) and was also a key aspect of Wari state ideology during its occupation and control of water in this important province of the empire (Glowacki and Malpass 2003). Furthermore, evidence shows that mountain veneration may have been a legitimizing strategy throughout the Wari Empire rather than just a characteristic of indigenous Cuzco cosmology.

Anders (1986), working at Azangaro, located in the core of the Wari Empire 15km from the polity's capital in Ayacucho, proposed that the site was specifically linked to mountain veneration. She also suggested that other Wari sites and respective architectural complexes may have been linked to propitiating mountain spirits. Most notably, she suggests that the 'wells' found full of ritual offerings at Cerro Amaru may be akin to the stone boxes used by modern populations in Chuschi to make ritual payments to mountain deities (Isbell 1978). Significantly, the offerings at Cerro Amaru, located near Viracochapampa on the northern periphery of the Wari Empire, consisted prominently of *Spondylus priceps* (McCown 1945), a valued bivalve originating from warm Ecuadorian waters and an object specifically linked to ritual requests for water during Inka times (Cobo 1956 [1653]; Glowacki and Malpass 2003).

Glowacki and Malpass (2003) describe the importance of landscape features to Wari expansion and the placement of Wari sites adjacent to water features as well as snowcapped peaks. They note that the Wari centre in the Sondondo Valley, Jincamocco, is placed near the nevado Señal Carhuarazo; two Wari sites in the Huaro Valley are located on the apu, Cerro Wiracochan; and they include in their listing Cerro Baúl, an apu in its own right located in the Upper Moquegua Valley.

Anders' (1986) research at Azangaro suggests links between snow-capped peaks in the region and the boundaries of the Wari heartland. Anders lists the prominent wamani in the area and associates four nevados with the quadripartition of the zone in the Middle Horizon and the Late Intermediate Period. Guaman Poma (1980 [1615]), a Spanish chronicler particularly familiar with the Ayacucho region and its indigenous pre-Inka kingdoms, described administrative units

of the former autochthonous Chanka Confederation polity as *wamani*. The size of these population segments is uncertain, but it is significant that mountain spirits in the region are still called by this same name, suggesting that territories were conceptually linked to the provinces of a mytho-political montane segmentation.

Apu on Wari's southern frontier

Don Juan Lopez Ventura has been performing the *pago*, or payment to the apu, for several decades ( Plate 1). He has also graciously performed the opening and closing *pagos* during the 2002 and 2004 excavation seasons at Cerro Baúl. He learned his trade as a youth through the teachings of his father, also a *curandero*. He apprentices two *maestros*, men who know the art of *pagos* who work with him.

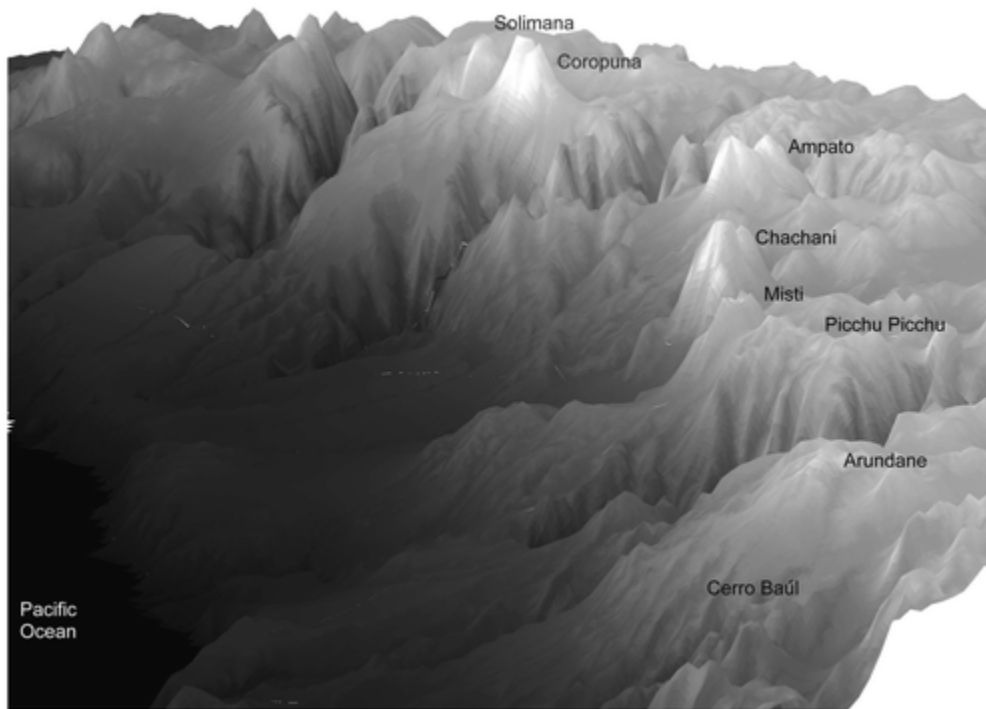


Plate 1 Don Juan Lopez offers the *pago* bundle to the apu on the summit of Cerro Baúl while the senior author kneels beside him.

He was appointed President of the *Comité de la Santísima Cruz de Cerro Baúl* and travels extensively in the South-Central Andes practicing his craft. A true shaman, he says, is marked by a physical deformity. In his case it is his clouded and blind right eye. Don Juan indicates that Cerro Baúl is an important apu in the chain of ancestral places in the circum-Titicaca Basin. In interview with us, he employed a sketch to illustrate how the cross on the mountain summit of Cerro Baúl is linked to other chains of apu. Baúl is important not only for its unique form, but also because it visibly links the valley with the snowcapped peaks that are also apu.

To the north is Tata Picchu Picchu ( Fig. 1), the most powerful of the apu visible from Cerro Baúl. Picchu Picchu is of male gender, Don Juan says, and forms the first in a chain of over a dozen apu peaks that stretches north through Arequipa to Cuzco (including Machu Picchu, the famous Inka site) and on to Juliaca on the shores of Lake Titicaca.

To the east is Coline (or Arundane), which forms part of a chain of over a dozen apu that stretch to the north east, ending at San Ignacio, Ichuño, and Sanchez Cerro. Don Juan's sketch also includes other apu strings that do not link with Cerro Baúl, but which run from San Pedro, Bolivia, through the department of Puno, Peru, and end at La Paz and Copacabana. Offerings are made to the apu to ensure success in business, marriage, agriculture, etc. These offerings, or pagos, have many different forms, but almost always include coca leaves, llama fat, sugar, alcohol and often cigarettes. Sometimes they include the sacrifice of an animal.

The pago is a complex rite, but one aspect involves blowing on the coca leaves to bring the prayers to the apu. As Don Juan blows the leaves he mentions each apu by name, starting with those closest in the string and moving down. Pagos representing different requests may invoke different apu, and a complex knowledge base surrounds each offering. Don Juan indicates that charlatans abound in these rites, and that requests will not be honoured if the apu are not supplicated properly.

While offerings can be made to apu even without being able to see them, visibility plays a role in maintaining this complex of knowledge of the supernatural. The strings of apu that tie this system together reference each other through inter-visibility and the strings are the subject of ritual pilgrimages by shamans like Don Juan. For him, Moquegua's apu reference an extensive ritual landscape that covers the entire circum-Titicaca Basin, hundreds of kilometres in diameter.

Each of the apu visible from Cerro Baúl forms part of a string of apu that link large geographic areas together. They are integrative mechanisms that join distant regions to one another. For many pilgrims, the peaks visible from Cerro Baúl are the apu of primary reference. For Juan Lopez, they are part of a wider universe. These knowledge systems connect ritual specialists who share this understanding of the regional apu. The apu thus serve to join distant areas together; local apu may provide visual cues for specialists to a wider network. Those same visual cues can help concretize distant connections to local people and thus incorporate their cosmos into a larger system. Apu sighting is a way in which unseen associations can be referenced in a visual landscape. To test this concept of visualization further, we turn to a visual analysis of landscape and apu in the region around Cerro Baúl.

Viewshed analyses of the southern Apu

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The principal apu of the Moquegua Valley are generally not visible from the confines of the verdant valleys. It is, however, nearly impossible for an observer to be at every point on the landscape to observe visibility. Here, we turn to a visualization tool inherent in topographic analysis – the viewshed. Utilizing the capabilities of geographic information systems (GIS) technology, viewsheds map out the area within visual detection from a point across a topographic surface. A viewshed calculates the area visible from a point on a landscape, much like a watershed calculates the topographic area that contributes to the flow of water to a specific point.

In order to assess the inter-visibility of snow-capped mountain peaks with the valley settlements and Cerro Baúl, visibility maps were generated for the principal mountain peaks above the snow line at c. 5000m and Cerro Baúl itself. The data source is an SRTM 90m resolution digital terrain model of the southern Peruvian landscape created by the Shuttle Radar Topography Missions ( Fig. 2). Visibility analysis was restricted to an area within 100km of the observer viewpoint, as it marks the limit of human sight on a clear day in this environment. The results indicate that the promontory of Cerro Baúl has greater inter-visibility with mountain peaks above 5000m in elevation than any other point in the valley. It also illustrates several chains of hills that block the views of distant peaks from almost all points except Cerro Baúl (Fig. 1).



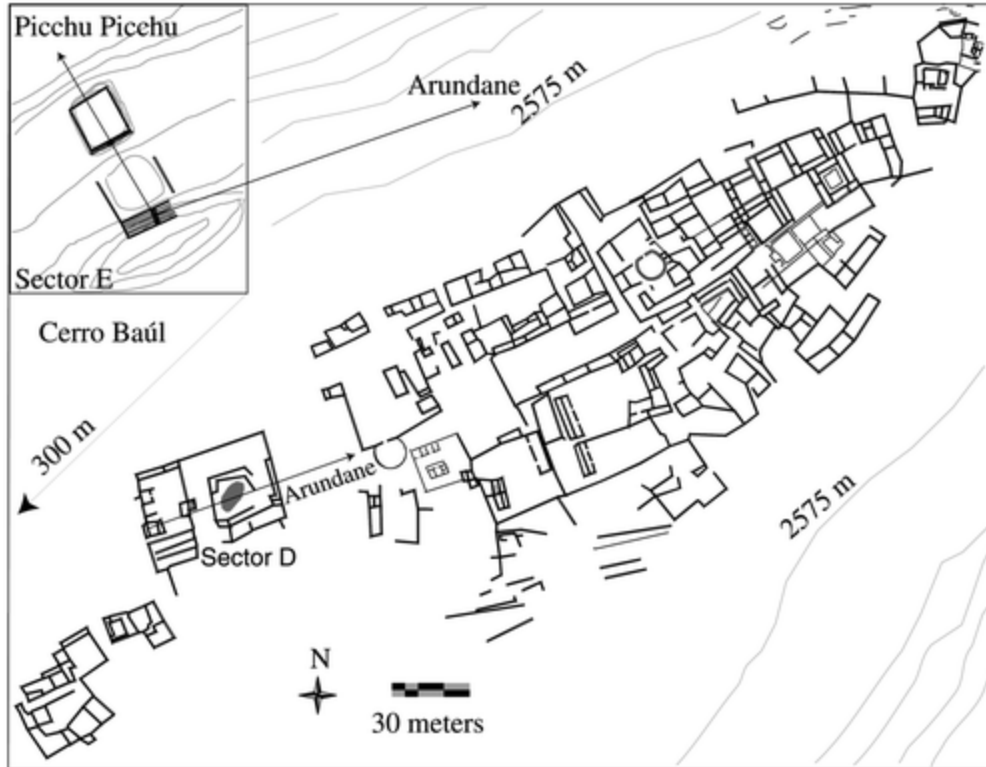


Figure 2 Digital elevation model derived from the SRTM 90m resolution data set of the volcanic chain of southern Peru. Vertical exaggeration is ten times horizontal resolution with view from south to north.

In practice, some peaks are more clearly visible from Cerro Baúl than others identified in the visibility analysis. Local topographic variations not entirely accounted for in the relatively coarse 90m elevation data can affect visibility. For example, the Picchu Picchu peaks, 30 degrees west of north from Cerro Baúl, sit in a local topographic dip relative to the Baúl massif ( Plate 2). This foreground dip makes these peaks much more visible than their other northern counterparts. Likewise, the valley incised by the Torata River and the Quebrada Cocotea to the north east make the peaks of Arundane and Hauilau much more prominent than their neighbours (Plate 3).

**Plate 2 and 3 photos have been omitted from this formatted document.**

Thus, while over half a dozen peaks might be recognizable from Cerro Baúl, there are but three peaks, Picchu Picchu, Hauilau and Arundane, which are predominant on the landscape. Not surprisingly, two of these peaks (Picchu Picchu and Arundane/Coline) are also the principal regional apu acknowledged by modern religious pilgrims and shamans like Don Juan in addition to Cerro Baúl itself. As we now illustrate, it is most likely that these were also the two peaks in addition to Cerro Baúl that the Wari also recognized as the regional apu.

Ritual architecture and apu sighting at Cerro Baúl

Architectural orientations at Cerro Baúl are somewhat constrained by the topography of the hill. There are two complexes, however, that have clear alignments to the most visible mountain peaks of Picchu Picchu and Arundane. Both of these complexes are set apart from the rest of the architectural core ( Fig. 3), and have been denominated Sectors D and E respectively. They both also utilize staircases, sunken plazas and elevated platforms to create three dimensional synergies with the landscape beyond.

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Sector D is a complex constructed just west of the main Wari site around the largest andesite boulder protruding out of the sandstone matrix of the mesa. The top of the boulder sits 2–3m above the ground surface and is the highest natural point on the mesa summit. It is a unique natural phenomenon and may have been viewed as a sacred rock due to its central location, prominence and distinctive form. Around the great boulder, the Wari constructed a 30 × 50m architectural complex composed of a western viewing platform with a staircase leading down into a plaza that surrounded the great rock. The walls of the plaza complex and the alignment of the viewing platform, staircase and the summit of the boulder diverge from the more north-easterly orientation of the adjacent ruins. They align perfectly with the central Arundane peak, however, and are the only architecture at the site to conform to this orientation.

At the back of the viewing platform are two small rooms that frame the alignment of the staircase with the boulder and the peak of Arundane on the distant horizon. The boulder may have served as a surrogate for the mountain peak and for offerings made to it. Unfortunately, looters have destroyed the area directly adjacent to the boulder and no direct evidence of what these offerings may have been has yet been recovered. Nevertheless, future research in the platform complex may yield new clues to the relationship between the Wari and the Arundane apu. Other evidence for apu worship has been recovered from the far west side of the mountain.

Sector E, denominated the Picchu Picchu Platform complex, comprises a 16×20m platform fronted by a sunken court ( Plate 2), which is flanked by a terraced hillside. The complex is oriented 30 degrees west of north and has two aligned staircases. One staircase descends the terraced hillside. It channels its traffic through the sunken court toward the platform, where a second staircase ascends the dais (Fig. 3 inset). Looking from the top of the terraced hill across both staircases, one cannot deny the clear alignment of the staircases with the peak of Picchu Picchu in the background.

Excavations within the platform yielded in situ burnt offerings dating to the construction of the platform. A radiocarbon date processed on one of these platform construction offerings yielded a calibrated age of 1366 ± 35 bp (AA-46599; cal. ad 600–770). The radiocarbon data clearly place the platform construction within the realm of the first Wari occupations at the site (Nash and Williams 2005).

In fact, this complex is the only place on the site where Picchu Picchu falls perfectly within the topographic dip in the foreground hills. A procession down the terraced hillside staircase, across the sunken court and up the platform staircase would unmistakably move directly towards the Picchu Picchu peaks. Furthermore, the cultural space created by the complex, moving from a high terraced hillside into a sunken court and up the steps of an elevated platform, replicates the natural topography beyond. The high point of Cerro Baúl falls to the valley below and ascends through the dip in the distant hills to the glorious peaks of Picchu Picchu in the distance.

Ritual progression through this space may have mimicked the movement of goods and people from Moquegua to the peaks of Picchu Picchu and beyond to the Wari heartland. The complex in Sector E was a ritual conduit symbolizing the connection of Baúl and the Moquegua province to the peoples of the north. It linked the symbolic centre of Moquegua with the symbolic points on the road to Ayacucho and thus tied the Moquegua apu to a larger system of ideological significance.

Discussion: the cult of the apu

The cults surrounding the apu of Arundane and Picchu Picchu thrived at Cerro Baúl during the period of the expansive highland states, c. ad 500–1100. Baúl served as a nexus for the integration of local ideologies of ancestry and supernatural power with regional and imperial ideologies and as an apu itself. Arundane may have been viewed as the ancestral origin of the local groups, as well as the apu most closely related to the altiplano and the Tiwanaku realm. Picchu Picchu, on the road to Wari itself, was the apu associated with Wari regional identity and, through its links to mountains closer to Wari, with the imperial identity.

Each apu had its own ritual complex, spatially segregated from the others and from the rest of the architecture at the site. Each may have had its own ritual attendants dedicated to that particular shrine. Future excavations in adjacent architectural complexes that appear more residential may shed new light on this hypothesis. The clear orientation of architectural features with the peaks on the horizon indicates the dedication of these complexes to their respective apu. The use of three-dimensional architectural space to highlight features within each complex and call out the features of the landscape beyond made these linkages all the more impressive.

The settlement of Cerro Baúl itself placed those who resided on its summit in the same league as the revered mountain deities. It drew resources from the surrounding populations based not only on economic and political persuasion, but as a pivotal point in the religious belief systems of the people themselves. Thus, political authority was reinforced by placing it in a system of values that merged with local perspectives on sacredness and ancestry.

Conclusions

Mountains are important places in the Andean cognitive landscape. They serve as protectors and punishers to local populations who view them as powerful deities. These same peaks link people

from different communities together as supplicants of the same maximal social groups. As such, they are prime constituents for usurpation by state ideologies of incorporation and control.

GIS-based viewshed analysis can provide a means of assessing which points on the landscape are likely to be recognized by a large number of communities. In association with ethnohistoric and ethnographic data, it can be a powerful tool for investigating the cognitive landscapes of the past. The analysis presented here illustrates the importance of combining ethnographic and archaeological data with modelled parameters. One of the most visible peaks, Haulau, did not form part a shaman's account of apu, or of the architectural alignments visible from an ancient Wari site. Yet, in two other cases, architectural alignments with prominent peaks highlighted by viewshed analysis are well documented in Wari structural design. These same peaks are highlighted as important in the sacred landscape today.

Religious motivations can be a primary factor in extension of imperial control over a region. As for the Inka, the inclusion of local religious traditions in an imperial ideology was key to early state expansion in the Andes. On the southern Wari frontier, local deities were incorporated into the state pantheon by establishing a state centred on the local apu, by constructing architectural complexes oriented towards the distant snowcapped peaks and by performing rituals of veneration within these complexes that tied people and their sacred places to the Wari elites.

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