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COMPARISON BETWEEN TWO INCA SITES, LOCATED NORTH AND SOUTH OF THE TROPIC OF CAPRICORN

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ABSTRACT

The importance of perceptions of geographical latitude and its calendrical properties have been emphasized in studies of cultural astronomy (Broda 2004), as well as the link that is generated between the landscapes that serve as horizons and the observations themselves, especially solar.

The pre-Hispanic world views, quite possibly, were heavily loaded with dualistic perspectives, especially the astronomical phenomena among the American tropics (Isbell 1982: 354). The search for temporary referents, especially seasonal associating them with contrasting moments such as sowing activities in front of harvest, with positions of the sun, both in the zenith and in the nadir.

In this context in Inca archeology, spatial configurations have been identified, which could be qualified as ritual landscapes, constituted by carefully designed settlements and their corresponding geography of the environment, immediate geography as well as geographical aspects at great distances. Settlements and geographies closely linked by scheduled ritual activities, such as pilgrimage tours, territorial exercises and memory constructions. These particular configurations were denominated as Cuzco, which the Inca society replicated in several territories and many of them to great distances at continental level (Hylop 1990, Farrington 1999), while Cuzco represented a concept goes beyond trying to repeat Symbolic spaces in the Inca foundations in the wamanis (spaces where certain ancestors exercised territoriality), in an attempt to hierarchize the spaces as part of a process of constitution and unification of the Tawantinsuyu. In this sense, in the "New Cuzcos" we find manifestations of the Inka ideology, but these are not copies or repetitions of their imperial capital, but they sought to adapt to particular situations in the conquered territories (Pino Matos 2004). The strategy of appropriation of the conquered sacred sites was based on the re-signification of the local huacas (deities and ancestors located in notable aspects of geography) in function of a significant solar phenomenon, (Example: In Chinchaycocha, the ushnu de Pumpu is in the direction of an important local mountain -Nevado de Ulcumayu-, that coincides with the sunrise the day of the passage of this star by the zenith (Pino Matos and Moreano Montalvan 2014), in the Shincal, the ushnu is oriented towards the sunrise at the middle temporal equinox and towards huacas in the eastern and western hills.

In the present work, two sites will be analyzed, one in Argentina and the other in Peru, trying to understand the management of time and the construction of ritual landscapes at different latitudes during the Inca period.

KEYWORDS: El Shincal – Pumpu – The Capricorn Tropics - landscape – ushnu - huaca

1. INTRODUCTION

Until now, many comparative studies of remote Inca sites, such as those dealt with in this work, have not been carried out. We have abundant information of sites between the tropics of Capricorn and Ecuador, for example the site of Pumpu in the highlands of Chinchaycocha (Pino Matos and Moreano Montalvan 2014), where we know that there are places that were previously part of landscapes and sacred itineraries, and that the Inca society then considers them in their political-ideological projects. In Pumpu, to the north, as to the south, you can see a whole adoratorios route that were the scene of ancient historical events that made be transformed into places of ritual importance. We see in this site mode of appropriation that had the Incas with existing landscapes. We do not have the same ethnohistorical information about the El Shincal site, but we assume that the appropriation logic is the same, therefore the comparison between both sites is important (Figure 1).



Figure 1 - Map showing the location of the sites compared

2. EL SHINCAL DE QUIMIVIL

This settlement is located in the province of Catamarca, Argentina about 4 km from the town of Londres, between Quimivil and Hondo rivers, is one of the features that resembled the "New Cusco" with the original Cusco (Hylop 1990 Farrington 1999).

The first publications that refer to archaeological excavation work were carried out by A. R. González (1966) who studied particularly the elite sector known as "Casa del Curaca".

At present, the regional importance of El Shincal in the Inca world of the south is accepted. The characteristics that define El Shincal as the political-administrative-ceremonial regional capital are the great square, kallankas on its flanks, a central ushnu

and elements of the landscape that would have functioned as guidelines and representations similar to those identified in Cusco (Farrington 1999).

We consider that the comparison between these sites is important because the ushnu de Pumpu is oriented towards the sunrise, the day of the passage through the zenith. In addition, the axis of its square is in equinoctial relation.

There are other Inca sites in the Chinchaysuyu with equinoctial implications such as Huánuco Pampa (Pino Matos 2004). The ushnu of Pumpu relates the direction of sunrise, the day of the passage through the zenith, with the sacred mountain called Ulcumayo.

Based on ethnohistorical information, it is possible to reconstruct a local mythical landscape for the region of Chinchaycocha (Pino Matos and Moreano, 2014). We also have information on how the sacred sites were redefined after the arrival of the Incas. And we assumed that the mechanisms of appropriation were the same. We try to use this knowledge to interpret the orientations of The Shincal.

3. THE USHNU DE EL SHINCAL

This ushnu is the largest structure of its kind, south of Cochabamba (Raffino *et al.* 1997), on the west side has an access ladder. It consists of nine steps that rise a total of 1 m, to end in a simple vain of trapezoidal morphology that would correspond to the access door to the interior of the platform (Giovannetti 2015). The walls are of double type (between 0.80 and 1 m thick) filled with mud to settle (Figure 2). All the rocks with which the ushnu was built, were worked to achieve flat and straight faces. Like the ushnu of Huanuco Pampa, has an inner tiana or bench (Raffino 2004). It is an elongated structure 3 m long by 0.80 m thick and 0.80 m high. It is placed very close to the north wall of the structure and is arranged in such a way that its main axis is in the east-west direction.

Ushnu position is almost central in relation to the main square. We must mention that, although the site suffered a reconstruction of some of its structures in recent years, the ushnu was only slightly intervened.

Within the great square, the ushnu is not only shown as the representation of a stage of rites and ceremonies during important events, but also, the spatial axis that marks alignments towards points that surely played a fundamental role in the sacred landscape. (Farrington *et al.* 2015: 58, Moyano *et al.* 2015: 258)

The ushnu and the plaza are framed between four hills that have anthropic evidence. The east and west hills were artificially flattened. In the south hill (Cerro La Loma Larga) material remains have been

found before the Incas (associated with the Aguada Culture) (Gonzalez 1998). To the north, another hill suggests a similar importance to the eastern and western hills due to the amount of vestiges on its surface and surroundings (access stairway, circular constructions and carved rocks). Ian Farrington in his work on El Shincal during the 1990s (Farrington 1999) located several of the sacred spaces in the surrounding geography, being the first archaeologist to alert about the cultural importance of the nearby hills.



Figure 2 - Plan view of the Ushnu of El Shincal de Quimivil

The Aterrazado Oriental Hill is located outside the east wall of the large plaza. With an approximate height of 25 m with a staircase of 103 steps facing the square. At the top of this hill we find a semicircle of stone that could be identified as a huaca (Figure 3).

The western hill has a narrow zigzagging staircase 60 steps. Once at the top of the hill are five rocks, granitic outcrops own hill, where its irregular shape shown, retaining its natural form.

In this hill we find anthropic manifestations similar to the eastern hill, like two rocks and mortars. The hill has a very well constructed wall that covers the entire slope of the hill making changes of direction to mark a morphology also cut as zig-zag. This wall shows a form of appropriation of cusqueño style architectural design, similar to that observed in Saqsaywaman and Wata in Cusco, Incallajta in Bolivia (Hyslop 1990) and Turi Inca site in Chile (Berguer and Salazar 2017).

In the west hill, the rocks that unfold in their top, possibly conformed a huaca. We do not know-if prior to the arrival of the Incas worshiped this hill, although it is known that was taken by these conquerors as a special space (Giovannetti 2016: 85-92).

Both hills were flattened, their walls walled and have stairs built with hundreds of rocks. In addition to giving them an imposing appearance, it puts them in a practically unique situation between the Inca archaeological sites of northwestern Argentina.

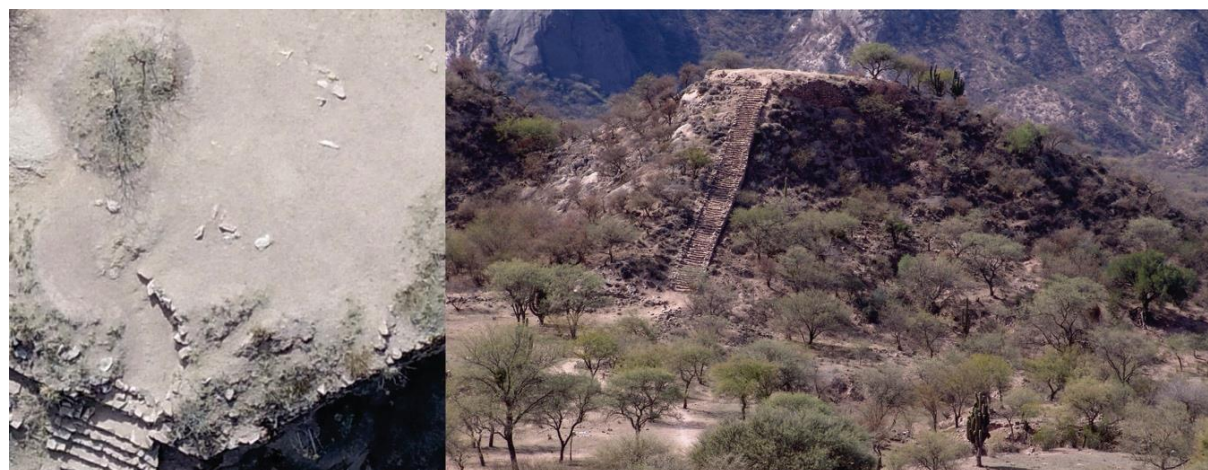


Figure 3 - Izquierda: Vista en planta donde se observa el semicírculo de piedras. - Derecha: Vista del Cerro donde se puede observar la escalera.

4. PUMPU

Pumpu archaeological site, is a large settlement planned by the lake Chinchaycocha. Located in the Bombom plain in the Junín region, in the central highlands of Peru (Pino Matos and Moreano Montalván 2014).

In this settlement it has a trapezoidal plaza, open to the west, and at the open end a ushnu ceremonial platform is located, facing east, with a slight south-east deviation. This platform is built in intimate association with the rocky outcrops of the environment, which were used to define its axis, but taking into account solar positions that help to set the time for

the control of their rituals (Pino Matos and Moreano Montalván 2014). The interesting thing about these sites present in tropical areas, is the ability to perceive the passage of the sun through the zenith twice a year. We know that there is a close link between the solar cult and the cult of the local landscape. Especially when the sun rises the days of its passage through the zenith. In this way, the design of this settlement, not only responded to orientations towards the hills, but had a strong astronomical component. The ritual dates were embodied in the local landscape, with emphasis on the solar cult, which marked the rhythm of the rituals.

Ushnu of Pumpu, is oriented in the direction of two features ($99^\circ - 279^\circ$ azimuth), topographic, snowy Ulcumayo, east, and the snowy Chacua, west (Figure 4). A spatial and visual Pumpu the level plain, rock formations and snowy as topographical features and outstanding toponímicos, keep a fairly close relationship with the mythical episodes of the groups living in the area before the arrival of the Incas.

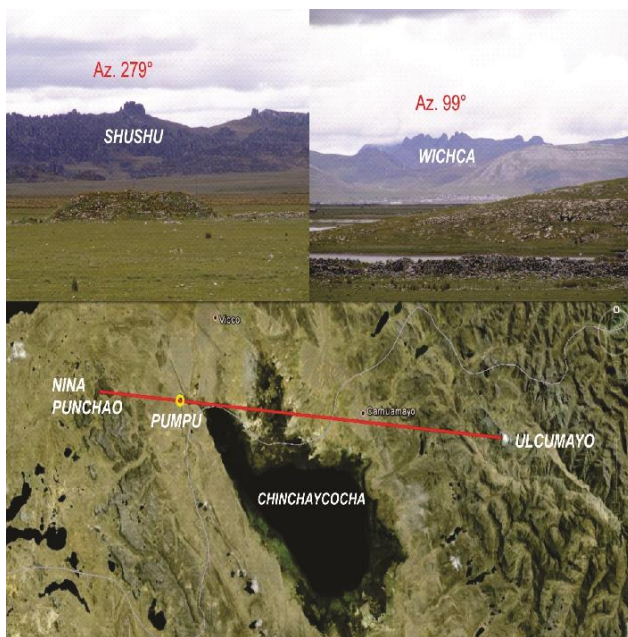


Figure 4 - Orientation of the Pumpu ushnu

That is, the presence of Ushnu of Pumpu would be reaffirming the importance of a transcendent mythic episode for the local population and the re-appropriation of an important ritual space.

On the ushnu of Pumpu, it is raised and emphasized that its location and construction was a crucial aspect for the beginning of the planning and construction of the settlement, considering that the central point of the ushnu platform was the first thing established in these settlements (Matos 1987 : so; 1994: 279-284).

Especially if these were meeting spaces for the realization of scheduled festivities, which should have visible astronomical references to indicate the dates accurately. John Hyslop and Ramiro Matos argued that the design of the site of Pumpu and the shape of its square would be closely related to its astronomical axes, especially if the ushnu is taken as a point of reference and observation for the determination of the solstices, equinoxes and positions of the sun in its passages by the zenith and anti-zenith (Matos 1987: 48,58; Hyslop 1990: 237-238).

It should be noted that the axis of the ushnu to the east is directed towards the snowy Ulcumayu ($100^\circ 55'$ azimuth). This axis is oriented, in turn, toward the sunrise when it is time to go through the zenith in October and February.

5. OBSERVATIONS IN EL SHINCAL

In this work we made observation in the place, of the equinoxes of March 2015 and September 2016, from the ushnu, in order to obtain heights and azimuths of the important points of the east and west hills and the relationship of the ushnu with the movement of the sun. For this we use a Suunto tandem that has a compass (accuracy 1/3) and a clinometer (accuracy 1/4). Magnetic corrections for observation dates were obtained from the National Geophysical Data Center [NGDC]. In addition, site plans were performed with a Total Station Pentax R-315NX (angular accuracy $\pm 5''$). Georeferencing was performed using a Differential GPS Thales Mobile Mapper. (Giovannetti *et al.*, 2013).

The magnetic declination in El Shincal for March 21, 2015 was $4^\circ 09' W$ varying $0^\circ 18' W$ per year (with an error (Uncertainty) of $0,36^\circ$) and for September 20, 2016 it was $4^\circ 22' W$ varying $0^\circ 11' W$ per year (with an error of $0,22^\circ$).

Once the data have been obtained, we have made the calculation of the corresponding declines using the equations of change of coordinates from the horizontal to the celestial equatorial system (Baume 2014) and using the Bennett model, for the correction by refraction (Bennett 1982).

As mentioned ushnu is within a rectangular place, but does not share the same orientation, ushnu is rotated with respect to the place about 4° . And the place is oriented cardinally (with an error of 1° on average).

We consider that the ushnu orientation responds to two causes:

- The line that passes through the circle of stones on Cerro Este ($A = 84^\circ 50'$) and the huaca rock of Cerro Occidental ($A = 265^\circ$)

¹ Precision (ISO 17123-3)

- 10'), both measured from the ushnu. Both data corrected by magnetic deviation.
- b) The sunrise at the equinoxes of March and September, but the equinoctial orientation would not correspond to the astronomical

equinox (δ del Sol = 0°) as some authors affirm (Moyano 2013, Moyano et al 2015, Farrington et al 2015), it would correspond to the middle temporal equinox. (Ruggles 1997, González García and Belmonte 2006) (Figure 5).

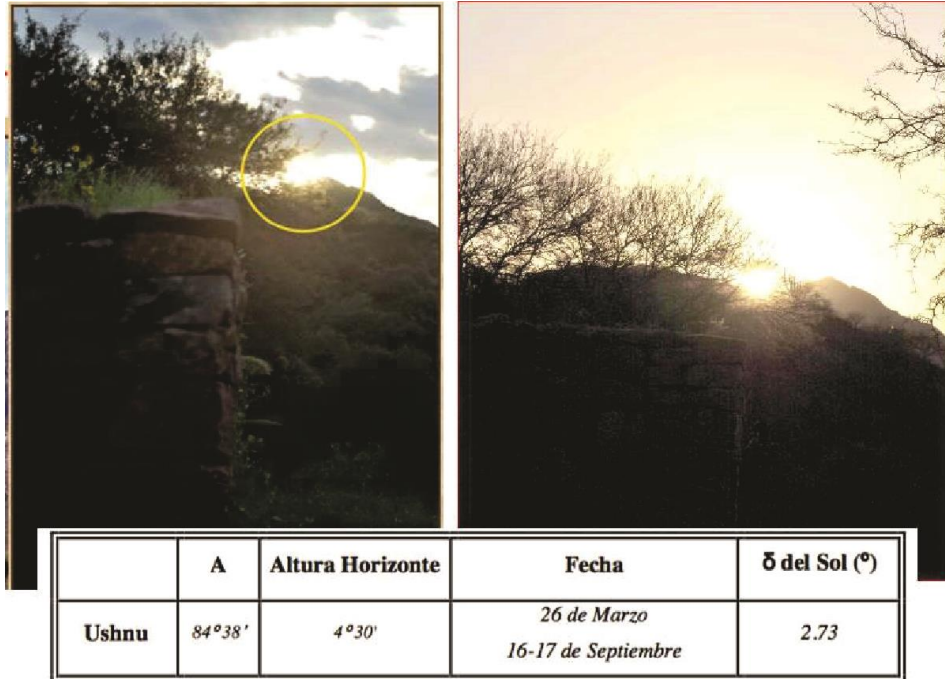


Figure 5 - Left: Sunrise at the astronomical equinox of March 2015. Right: Sunrise on September 18, 2016. Table: Ushnu orientation data, A, corrected by magnetic deviation.

Construction and location of ushnu could respond to the idea of the Incas of resignificar the important elements of the existing landscape of the conquered territories, reusing potentially sacred elements of the local topography. (Giovannetti 2015, Moyano 2010). In the case of El Shincal the alignment of the ushnu with the eastern and western hills would respond to this idea. In which we see that the orientation

towards the hills (which we find in other Inca sites) is superimposed on the orientation of the sunrise on an important solar date (Figure 6). This would be similar to what happens in Pumpu, where the axis of ushnu also correspond to the orientation towards important hills of the local landscape (which are wacas) overlaps with sunrise on the zenith passage in place (Pino Matos and Moreano 2014).



Figure 6 - Ushnu orientation with respect to the east and west hills.

6. CONCLUSION

It is important to assess the degree of integration of local landscapes within the Inca worldview on a site that is located near the southern end of the Tawantinsuyu. Part of territorial control was to master the forces emanating from each particular geography from also control their corresponding huacas, which could materialize as rocks, mountains or rivers.

After analyzing the information obtained in the ushnu of El Shincal de Quimivil, we see that its orientation would not be to the astronomical equinox, but that there is a compromise between the orientation to the middle temporal equinox, and two huacas in the eastern and western hills.

We found in Ushnu de El Shincal, the same ideas that we see in places like Pumpu, in the high plateau of Chichaicocha in Peru (Pino Matos and Moreano, 2014) in which the local landscape is related to important solar phenomena. We assume that different areas of tawantinsuyu the logic of appropriation or resignificacion holy sites are similar to the relevant local modifications. As we have already seen, in the case we study north of the tropics, it is associated with some important hills with the zenithal outlet of the sun and the anti-zenithal setting of it. And as to the south of the tropic, as we no longer have a zenital passage, the important hills are associated with another solar phenomenon, the equinox.

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