

2017

Uncovering the Mystery of Machu Picchu

Barbara Cardona

Stanford University, bcardon2@stanford.edu

Follow this and additional works at: <http://digitalcommons.butler.edu/bjur>

 Part of the [Ancient, Medieval, Renaissance and Baroque Art and Architecture Commons](#), [Architectural Engineering Commons](#), [Latin American History Commons](#), and the [Other Architecture Commons](#)

Recommended Citation

Cardona, Barbara (2017) "Uncovering the Mystery of Machu Picchu," *Butler Journal of Undergraduate Research*: Vol. 3 , Article 4.
Available at: <http://digitalcommons.butler.edu/bjur/vol3/iss1/4>

This Article is brought to you for free and open access by Digital Commons @ Butler University. It has been accepted for inclusion in Butler Journal of Undergraduate Research by an authorized editor of Digital Commons @ Butler University. For more information, please contact omacisaa@butler.edu.

UNCOVERING THE MYSTERY OF MACHU PICCHU

BARBARA CARDONA, STANFORD UNIVERSITY

MENTOR: ALLISON MICKEL

Abstract

If mysteries were ranked, Machu Picchu would be on the top of the list. This Incan site, destination for millions of tourists, archaeologists and researchers each year, is one of the biggest enigmas of Incan culture. Its mesmerizing view has prompted hundreds of unanswered questions about this civilization. Incan culture revolved around cities, built without reference to the world beyond. Although the Incas were incredible architects and inventors, they lack written records, shrouding their culture in mystery for many years. While research has illuminated some facets of Incan culture, a significant question still remains: what purpose did Machu Picchu play in Incan society? Over the years, many researchers in different fields have attempted to answer this questions. This article will analyze these findings and argue that a key purpose of Machu Picchu's design was to exploit its geographical advantages.

Machu Picchu Compared to Other Incan Cities

Incan civilization developed in Peru between c.1400 and 1533 CE and extended throughout South America from modern-day Quito, Ecuador in the north to Santiago, Chile in the south. This empire was the largest ever seen in the Americas and, at the time, the largest in the world. Due to the harsh, unpredictable environment in the Andes, the Incas managed to conquer people and amass territory in diverse areas, including mountains, deserts and jungles. Noted for their architectural style, they designed and established signature buildings wherever they conquered. Their finely-built structures, adapted to distinct natural landscapes like mountaintop settlements, continue to impress modern visitors.

During their brief reign, the Incas created massive cities as a testament to their incredible engineering skills. They arguably had the best-planned cities in the ancient Americas, using consistent features in each. One of the main characteristics of every Incan city was that a central plaza surrounded

by temples and public buildings. The center of each city consisted of temples, a palace for the visiting king, and houses for nobles and priests. Houses for common people were spread around the central area. Fortresses were built near each city for people to gather in times of danger.

The most famous Incan cities include a number of features with purposes figured out by archaeologists. Sacsahuaman, “arguably the greatest Inca ruin outside of Machu Picchu” (Adams 2011) overlooking Cuzco, the capital, is believed to have once been a royal fortress and retreat because of the zigzag walls built with enormous rocks. When Hiram Bingham went to Peru in 1911 to search for the Lost City, one of his priorities was to find Victor Rumi, an important Incan settlement. This site was built for religious purposes, featuring the “White Rock’ in Quechua—an intricately carved granite boulder the size of a city bus, which was once one of the holiest shrines in the Inca Empire” (Adams 2011). Pisac, another Incan settlement less than an hour away from Cuzco, is noted for its “curving agricultural terraces” (Adams 2011) and its carved rocks used for astronomical observations.

Cuzco, the capital, served purposes both political and religious. This holy city was home to the residences of its rulers and were bustling with activity. With its peculiar staircase design and twenty degree temperature variation between top and bottom, researchers believe the city “Moray was an Inca agricultural site where experiments on crops were conducted” (Adams 2011). The Isla del Sol, an island in the middle of Lake Titicaca, is, according to the Incan creation myth “where the waters that once covered the Earth receded and the all-powerful sun god, Inti, first emerged” (Adams 2011).

Unlike these other cities and the typical structures used by the Inca when building new places, Machu Picchu has no clear role. There is no main building overshadowing other structures. Machu Picchu is so mysterious because it not only encompasses a mixture of characteristics present in other Incan cities and offers several unique features not found elsewhere.

Literature Review: Previous Research on the Role of Machu Picchu

One of the existing theories attempting to explain the role of Machu Picchu in Incan society is that this site was built for astronomical purposes. Observatories were essential to the Incas because they needed them to plan their agricultural activities and govern ceremonial occasions. University of Arizona scholars Dearborn and White studied the Torreón, a building in

Machu Picchu, assuming that the building guided the life of the Inca who lived there. According to the authors, the Torreón was “designed as a precise instrument for fixing the date of the winter solstice as well as designing a period about the zenith passage date and for observing certain constellations” and was built with such preciseness and carefulness which justify why everything in Machu Picchu should have revolved around this exact building (Dearborn and White 1983, 37). The Incas used the Torreón as an observatory to see the solstice and predict its occurrence with good accuracy similar to how they used a building akin in Pisa, another Inca settlement (Ziegler and Malville 1996). The research agrees that Torreón was a precise instrument for astronomical observations.

Machu Picchu’s location undoubtedly provided an unobstructed view of astronomical phenomena, explaining the importance of the Torreón. However, out of the more than 150 buildings located in this site, only the Torreón, the Intihuatana stone, and the Room of the Three Windows are the built to observe celestial events. This means that less than 2% of the buildings in Machu Picchu were built for astronomical purposes. On the strength of this number, it can be assumed that although astronomical observation was culturally important and possible at the site, Machu Picchu was not built with this primary focus.

Another theory suggests that Machu Picchu was built as a royal estate for the Incan king Pachacuti. Yale University researchers Richard Burger and Lucy Salazar suggest that Machu Picchu was built in a seemingly inconceivable location requiring extensive labor to serve as a symbol of the king’s divine power, authority, and legitimacy (Burger and Salazar 2004, 25). Another researcher argued it was built to commemorate Pachacuti’s conquests and to support his family lineage (MacQuarrie 2014).

While this theory is appealing, it has several flaws. According to Guillermo Cock, a Lima-based archaeologist and research associate at UCLA, “the members of Pachacuti’s *panaca* may have lived there during the year for a few days, weeks, or months,” but there is no evidence that Machu Picchu was primarily built for the royal family to spend a few nights there (Cock 1986, 115). Furthermore, the royal estates theory was first proposed in the 1980s and was “largely based on a 16th-century Spanish document that referred to a royal estate called Picchu, which was built in the same general area as Machu Picchu” but was smaller and less significant (Cock 1986, 121). At the time of its development, this theory held more weight because the extent of Pachacuti’s royal estates were not fully understood. In context with the other royal estates, Machu Picchu does not fit.

Due to the terraces in the site, it has been theorized that Machu Picchu may have been built for agriculture. This theory suggests Machu Picchu existed as a self-contained city intended to produce its own food and export food (mostly maize) to other cities. Archaeologist Ann Kendall explains that the terraces were extremely efficient at conserving scarce rainwater and the site was perfectly suited for agriculture (Kendall 2011).

Despite this evidence for an agricultural purpose, there may still be other factors at work. According to Brian Bauer, an expert in Andean civilization at the University of Illinois at Chicago: “Machu Picchu—which was built around A.D. 1450—was, in fact, relatively small by Inca standards and maintained only about 500 to 750 people” (Bauer 2015, 68). Machu Picchu’s residents almost certainly made use of the terraces surrounding it for farming, but “these terraces alone couldn’t have sustained the estimated population of the day and that farming most likely also took place in the surrounding hills” (Bauer 2015, 68).

Hiram Bingham, the discoverer of Machu Picchu, believed after first discovering the site that the Inca Virgins of the Sun fled from Cuzco to Machu Picchu in an attempt to escape Spanish conquerers. According to Incan tradition and culture, exceptionally beautiful virgins were chosen to become priests and serve the gods. They were part of a holy order of Chosen Women dedicated to the Inca God of the Sun, Inti. Bingham believed that Machu Picchu sheltered a large number of these women since several female skeletons were found by Bingham’s team buried inside different caves in Machu Picchu. Hiram Bingham concluded that “the Chosen Women whose lives from early girlhood had been devoted to all the duties of the Sanctuary found a refuge from the animosity and lust of the conquistadors” at Machu Picchu (Bingham 1952, 266).

While the theory of Machu Picchu as home of the Chosen Women persisted for decades, there is recent research suggesting it may not be accurate. In 2003, Yale researcher J.W. Verano discovered the female skeletons discovered by Bingham’s were actually half male and half female. According to Verano, at the time of the discovery, science hadn’t arrived at an understanding of skeletal differences between genders. Without this knowledge, the Bingham team couldn’t know that Andean skeletons were generally shorter and less robust than African and European skeletons. Small bones did not necessarily indicate female skeletons. Verano discovered that some of the skeletons belonged to children and helpers from all over the empire. (Turner et al. 2010)

While a number of theories have been proposed over the years, they are still open for question as research continues and new theories are developed.

Geography as Leading Cause

After a literature review and analyzing previous theories regarding the Machu Picchu site, the notion that Machu Picchu was built to take advantage of the geographical region encompasses most theories and established knowledge about how the Inca operated.

Religion was, for the Incas, as with various other ancient cultures, attached to history, politics, and the functioning of their society. From government to marriage to burials, religion was attached to all stages of community life. Success and failure were determined by the Incan gods and ancestors. It was very important to their religious practices to keep their gods happy to prevent natural disasters such as earthquakes and droughts. With religion at the center of Incan life, it makes sense that Machu Picchu would be built on what the Inca considered holy landscape.

Machu Picchu is surrounded by the Urubamba River located 2000 feet below the citadel. This river curves around the mountain in which Machu Picchu is located and some of the agricultural terraces extend all the way down to the river. The river cannot be navigated at the location of Machu Picchu, but further down it is possible to use boats to navigate to the Amazon River and all the way to the Atlantic Ocean. This may have been purposeful to avoid having people navigate directly to Machu Picchu but still offer a relatively close route of transportation. The Urubamba River is oftentimes called the Vilcanota River, which translates to "sacred river." This river was considered sacred to the Inca partly because nature was sacred to them but also because of the advantages it brought (Clark 2011). Certainly the river was a consideration when analyzing the geography of the area.

Mountains also represented a holy symbol for the Inca. The snow-capped mountains seen from Machu Picchu were particularly holy as reliable sources of water. This location was rich in huacas, naturally sacred objects revered by the Inca. In this case, the top of the mountain represented a huaca and if Machu Picchu was built there, it would represent a huaca too (Clark 2011). The Inca related huacas to agricultural production and religious rituals.

According to the archaeologist, professor, and senior research fellow Johan Reinhard, Machu Picchu surely would have been seen as a prominent sacred center. He points out its religious significance is directly linked with

its geographical location. The Incas believed that the sun was their divine ancestor. Reinhard mentions that “the rising and setting of the sun, when viewed from specific locations within Machu Picchu, aligns neatly with religiously significant mountains during the solstices and equinoxes” (Reinhard 2007, 131). The Sun, the almighty god, was the propeller of life. It brought the light that plants need to create oxygen and without “him” the day did not exist. Most importantly, the sun was associated with being made of gold, so every artifact made of gold came from the god of the Sun. Reinhard suggests that Machu Picchu fits into a sacred geographical setting, pointing out that Machu Picchu’s location is “an example of cosmology intertwining with sacred landscape that is virtually unique in the Andes ... [and] that takes on a degree of sacrality because it combines the Earth and the sky, which are also combined in Incan thought.” (Reinhard 2007, 125).

The theory of Richard Burger, Lucy Salazar and Kim MacQuarrie about Machu Picchu serving as a royal estate may contain some truth. Since the Inca placed such value on religion, the Incan king Pachacuti could have decided to employ these geographical religious advantages in building Machu Picchu in this location. Once the citadel was built, the people living in it would be able to take advantage of these religious aspects. In this variation of the theory, Machu Picchu would have not been built with the main purpose of being a royal estate, but rather to use its geographical religious advantages to enhance a royal estate.

Machu Picchu’s altitude is also extremely important, synonymous with its proximity to the sun. When the Sun is a god, being up close to the sun facilitates a closer relationship with the Sun and the god. The Inca also believed a closer position to the Sun would facilitate the better practice of astronomical studies. The Inca needed astronomy to predict the changes of the seasons and to effectively organize their agricultural patterns, so building a settlement at this location would allow them to exploit this specific geographical feature.

Other geographical features made this site particularly attractive for the Inca. For instance, the mountains would allow them to build terraces in the southeastern part of the citadel in different shapes and sizes for crop growing and controlling rain-produced erosion (Wright and Zegarra 2001). Agriculture would not have been a main purpose because the terraces were not sufficient to cover the population’s needs, but rather were created to take maximum advantage of the location’s offerings.

Proximity to the rainforest was certainly another advantage of the geography of Machu Picchu. According to Benjamin Craig, “the rainforest was the only source of rare products that were prized by the Incas such as colorful bird feathers, butterflies, coca leaves, exotic fruits and vegetables and healing herbs among other products” (Craig 1999). The Inca would exchange these products with tribes from the rainforest for things that they did not have such as potatoes, guinea pigs, precious stones, quinoa, and gold and use them for religious ceremonies. When building Machu Picchu, the Inca must have considered the benefits from being so close to the rainforest as a trading source.

Its location once again presented an advantage because it was so remote and hard to access for people who did not know the route. Anything built on the site would be protected by nature and if the citadel was under attack, invaders would have a hard time getting there, providing a tremendous defensive advantage. There are no records that any battle ever took place here. The surrounding mountains served as a protection for whoever lived here, be it royal families, priests, and, in fact, any Incan commoner.

The theory presented in this paper suggests that the Inca decided to build in this area to take advantage of the comprehensive geography of the place. Later on, as other theories suggested, Machu Picchu may have had additional purposes such as supporting an astronomical research base, conducting religious ceremonies, growing crops, hosting the king when he visited, and providing a home for priests and Chosen Women, all distinctive facets of Incan culture. Ultimately, the Inca must have built Machu Picchu where it is to get the most out of what the geography of the place gave them.

Conclusion

For centuries, Machu Picchu was unknown to the outside world. Though the locals of this region knew of its existence, it remained untouched by researchers and archaeologists for years. When discovered, however, many questions arose, specifically: what was the purpose of building such a monumental site?

The aim of this paper was to propose a new theory that solved the problem of previous theories by incorporating the best aspects of them and leaving the most problematic aspects behind. This theory explains how Machu Picchu was built to maximize and take advantage of its comprehensive geographical location.

References

- Adams, Mark. 2011. "Top 10 Inca Ruins to See (That Aren't Machu Picchu)." *National Geographic*. Accessed November 23 2016. <http://www.nationalgeographic.com/travel/peru/machu-picchu/inca-ruins-photos/>
- Bauer, Brian S. 2015. *Vilcabamba and the Archaeology of Inca Resistance*. Los Angeles: Cotsen Institute of Archaeology Press.
- Bingham, Hiram. 1952. *Lost City of the Incas, the Story of Machu Picchu and Its Builders*. New York: Sterling Publishing Co.
- Burger, Richard L., and Lucy C. Salazar. 2004. *Machu Picchu: Unveiling the Mystery of the Incas*. New Haven: Yale University Press.
- Cock, Guillermo A., and Christopher B. Donnan. *The Pacatnamu Papers*. Los Angeles, CA: Univ. of California, Fowler Museum of Cultural History, 1986.
- Clark, Chuck. 2011. "Urubamba River." Machu Picchu. Accessed December 3, 2016. <http://www.incatrails.org/22-machu-pichu-urubamba-river.html>.
- Craig, Benjamin. 1999. "The Machu Picchu Model: Climate Change and Agricultural Diversity." *Native Americas* 16, no. 3/4: 76.
- Dearborn, D. S. and R. E. White. 1983. "The "Torreon" of Machu Picchu as an Observatory." *Journal for the History of Astronomy* 14, no. 5: S37-S49. <https://doi.org/10.1177/002182868301400502>
- Kendall, Ann. 2011. "Farming Like the Incas." *Smithsonian Institution*, September 11. <http://www.smithsonian.com/history/farming-like-the-incas-70263217/>
- MacQuarrie, Kim. 2014. "Pachacutec: The Incan Emperor Who Built Machu Picchu." *Kim MacQuarrie's Peru & South America Blog*, September 11. <http://www.kimmacquarrie.com/pachacutec-incan-emperor-built-machu-picchu/>
- Reinhard, Johan. 2007. *Machu Picchu: Exploring an Ancient Sacred Center*. Los Angeles: Cotsen Institute of Archaeology, University of California.
- Turner, Bethany, John D. Kingston, and George J Armelagos. 2010. "Variation in Dietary Histories Among the Immigrants of Machu Picchu: Carbon and Nitrogen Isotope Evidence." *Chungará (Arica)* 42, no. 2: 515-534. <https://doi.org/10.4067/S0717-73562010000200012>
- Wright, Kenneth R. and Alfredo Valencia Zegarra. 2001. *Machu Picchu: A Civil Engineering Marvel*. Reston, VA: American Society of Civil Engineers.

Ziegler, Gary and J. McKim Malville. 2004. "Machu Picchu, Inca Pachacutis Sacred City: A Multiple Ritual, Ceremonial and Administrative Center." *Adventure Specialists*, February 22. <http://www.adventurespecialists.org/mapi1.html>