

WHY THE INCA MAY HAVE CHOSEN

CUSCO AS THEIR CAPITAL

BY DAVID JOHNSON

DATA RECORDED IN JUNE 2001, NOVEMBER 2001, JULY 2002
AND JULY 2003

*** **PLEASE NOTE** – One of the most frustrating aspects of Peruvian research is determining the correct name and spelling for any given place in Peru. By the time I read through the documents available to me for this report I was thoroughly confused and frustrated in regard to the correct name and spelling for the sites discussed below. Therefore I chose the most commonly found place names and in some cases, included two or three of them for a single site. Please keep this in mind.

Introduction:

From 1996 to 2000, I concentrated my research on the Nasca Lines contained within the Rio Grande de Nasca drainage. During that time I formulated my hypothesis stating there is a correlation between geology, hydrology, archaeology and the Nasca Lines. Throughout my investigation of this region I found five features that consistently coincided at each site: geological features with the potential to conduct groundwater, freshwater sources, habitation sites, ancient cemeteries, and geoglyphs. Eventually I realized some of the geoglyphs mapped the course of concentrated veins of groundwater (Johnson 1998, 1999, 2002). During that time I began to wonder if other cultures were capable of tracing the course of concentrated groundwater veins. It was this curiosity that brought me to Cusco. When I arrived in Cusco I was even more intrigued by what I found because it exceeded my expectations. My data strongly suggests that the Inca not only traced concentrated groundwater sources and geological features, but also utilized a unique geological feature from which to rule their empire.

This report is divided into two parts. The first is based on scientific observations as well as my own of features that can be observed and examined by anyone. It is supported by data gathered by both geological and archeological surveys related to this region. The second part includes a controversial method of locating groundwater that is commonly rejected by scientists. This technique, which has never failed to locate concentrated veins of groundwater for me, is dowsing. Even if you totally reject the data gathered by dowsing one must seriously contemplate the data presented in part one. It has no association with dowsing and includes my own observations as well as those of other researchers. Some of the information included in part 1 is repeated in part 2 since dowsing is added to the scenario.

Part 1

Sacsayhuaman (Saqsaywaman)

Even today the size and scope of Sacsayhuaman is impressive in spite of the fact that we are observing only the ruins of what was, in its glory, one of the most important sites in the Inca Empire. Its present appearance can be attributed to the Spanish who used it as a stone quarry following the conquest. It is hard for us to fully comprehend its appearance at the time of the conquest since there are no known drawings of the site and the Spanish chronicles appear to be contaminated with European based metaphors (Urton, 1985, Hagen & Morris, 1998). However, by utilizing the shreds of evidence that remain, it is possible to unveil some of the mysteries that lay within its walls.



Sacsayhuaman as it appears today.

Mullion Structure – the Outcrop – Rodadero - Snake Hill

Within Sacsayhuaman there is an andesite outcrop, which is, according to geological studies, unique to South America and possibly unique within the world. In spite of this none of the archaeological reports that I have seen discuss its uniqueness or its special relationship to Sacsayhuaman and Cusco let alone the empire. All the reports I have seen simply refer to it as a hill or outcrop with an interesting topography and some archaeological features.

The Mullion





Examples of the folds



The surface is so smooth that it glistens in the sun.



The surface of the folds is so smooth that people use the groves as a natural slide.

In 1978, the Geological Society of America Bulletin published an article titled "The Extraordinary Striated Outcrop at Saqsaywaman, Peru" by Tomas Feininger. In the article he explains how the outcrop

was formed. “The andesite reached the Earth’s surface along an eruptive fissure. The first materials ejected were hot but solid blocks, which built an elongated, steep-sided mound. Later, viscous lava was extruded though the crest of the mound and flowed down its flanks. The stretching of the lava during floage caused its surface to become striated, analogous to the striations on the surface of pulled taffy.” In geological terms this outcrop is also referred to as a mullion structure, which is defined as “consisting of a series of parallel columns composed of folded bedrock”.

In 2002, three geologists, Steve Mabee, Don Weise and Ken Hardcastle, accompanied me to this site. After examining the outcrop they agreed with Feininger’s explanation of how it was created commenting, “The rock was subjected to faulting while the rock mass was still hot causing it to deform in this unique way. Instead of breaking or shattering along the fault plane creating breccia or gouge, the rock deformed and became grooved because it was still hot and quite malleable. The rock certainly is unique because the rock has to be just at the right temperature and depth to deform in this way. So it is obvious to see how it would stand out.” They also concluded that since the surface is so fresh and shows little or no erosion, the mullion was probably unearthed in recent times, perhaps by the Inca.

The first time I saw this feature I knew it was different than anything I had ever seen. I could not help but wonder if this feature influenced the Inca’s decision to locate their capital and some of their most sacred ceremonial sites near it. One cannot study the Inca without realizing they were acutely aware of the natural environment and learned to live in harmony with the harsh Andean environment. Living along active faults they constructed walls that could sustain earthquakes for several centuries. Following the mountain’s contours they constructed terraces to the snowcapped peaks. They transported water from springs to drier areas of the valley to nurture their crops. It is possible they also realized how unique this feature is especially since there is not another like it.

Since the birth of their culture is credited to have taken place at the Island of the Sun in Lake Titicaca, it would seem only natural that they would choose a site near that location for their capital, however they did not. When you examine Cusco you realize it was not chosen

for defensive purposes. There are several approaches to the city that are difficult to defend and local agriculture could not provide enough produce to meet the needs of the capital as it became more populated. It seems to me the Sacred Valley along the Urubamba River would have served as a more suitable site for the capital. The Urubamba Valley is protected by snowcapped mountains and is a cornucopia. In spite of these considerations they chose the present site of Cusco for their capital.

Could Feininger's comment, "The morphology of the outcrop is so remarkable that even the most casual observer is at once awed." have applied equally to the Inca? Feininger's conclusion contemplates an intriguing cultural question. "The striated outcrop at Saqsaywamán is obviously very young. The excellent preservation of its striations and the superb freshness of the morphology of the entire outcrop amply attest to its recency. The andesite must be Holocene, and it is probably, at most, only a few thousand years old. One may ask –Did the Incas, or their tribal forerunners, witness the extrusion of the lava, its flow, and the development of its striated surface? This intriguing possibility deserves further investigation and may be resolved by determining the stratigraphic position of the pyroclastic layer with respect to pre-colonial habitation sites away from the outcrop at Saqsaywamán." Although some geologists believe the outcrop may be much older, Feininger's concluding question cannot be dismissed without a more comprehensive investigation of the Inca's relationship to this outcrop.

Another consideration to ponder is when did the Inca or their forbearers first recognize the uniqueness of the mullion and begin to incorporate it within their mythology. Most documents report the construction of Sacsayhuaman began during the reign of the ninth Inca, Pachakuteq, sometime after 1438, this being only one hundred years before the Spanish conquest. Since the features of Sacsayhuaman surround the mullion it appears that he attributed some importance to this geological formation. Dismissing oral legends that may or may not be accurate one cannot help but wonder if the Inca ruler who established Cusco as the capital realized the mullion's uniqueness and chose this site for that purpose. Could other structures have preceded the construction of Sacsayhuaman at this location? Unfortunately this will never be determined since the Inca

had no written documents at that time and most of the current ruins contact the bedrock leaving no room for buried ruins beneath.

In some cases data suggests the Inca perceived images within the topography and constructed sites around them, for example the relationship between Condor Mountain and Pisac. When I first looked at the mullion it reminded me of a snake's back (or snakes) emerging above the surface of the ground for a moment and then submerging below it. Then I realized where it dove under the plaza, Explanada / Chukipanpa was directly across from what some people believe is the head of the puma represented by the zigzag walls, Baluarte. At this point it is important to incorporate Inca religious beliefs into the scenario. All of the Inca gods were connected somehow with life or nature or both. The most important were Pacha Mama and Pacha Tata, earth mother and father. The Inca believed in three worlds represented by the snake, puma and condor. The snake represented the underworld and was associated with intellect, knowledge and the past. It is also associated with water sources. The puma signified life in the present and represented courage and internal strength. They also believed it could communicate with spirits and forces within the earth (Urton, 1985). The condor represented the hereafter, the world above. It was associated with balance, the future and life in another dimension.

Could the Inca have envisioned contact between two deities within the landscape surrounding the mullion and thus constructed the city of Cusco in the shape of a puma with its head positioned where the snake dives back into the earth to create the imagery of two important mythological forces merging together? I think it is very possible they did. Consider the following.

During the last few years Aurelio Rodriguez and I have been studying the relationship between geological dikes and faults with archaeological sites. In addition to these geological features I have also found concentrated veins of groundwater associated with these features. I found this relationship at every site I surveyed. Our data suggests the serpentine trends of dikes, faults and the groundwater they conduct lead to their association with snakes in Inca mythology as well as other pre-Columbian cultures such as the Nasca. Susan Niles also refers to this in "Inca Architecture and the Sacred Landscape". Her data indicated there are several sites where snakes

are associated with liquid offerings and the earth (Niles, 1992). The undulating ridges and contours of the mullion give the appearance of a snake or snakes rising to the surface briefly before diving back into the ground. If the Inca envisioned the same imagery realizing its uniqueness and importance within their religion, they most certainly would have revered this feature. The mullion could have become the most important representation of the underworld.

This leads us to the shape of Cusco. The actual shape of Cusco at the time of the Spanish conquest is still a controversial subject. Some report the city was laid out in the shape of a puma with the zigzag walls of Sacsayhuaman representing the head. The city extended along the body to the tail where the two rivers located in the Cusco Valley merge. However Urton and others suggest this is a misrepresentation on behalf of the metaphors used in the Spanish chronicles since the lion in Europe was often associated with kings and their seat of power. Therefore the Spanish associated Cusco with the puma, which was the South American version of the lion (Urton, 1985). In "The Cities of the Ancient Andes" Hagen and Morris describe Cusco as extending from Sacsayhuaman to the confluence of the two rivers in the basic Inca kancha plan. Regardless of which version one accepts both imply Cusco extends from the mullion to the confluence of the two rivers. Thus suggesting the area where the mullion is located was important to those who planned the city. The most important festivals and ceremonies in the Inca culture were conducted at Sacsayhuaman, which surrounds the mullion.

Assume for a moment that the zigzag walls are part of the puma's head. It is placed directly across the plaza from where the snake(s) representing the underworld has for a brief moment entered the present world of the living represented by the puma. Possibly providing an opportunity to communicate between them; as if the puma's ears are there to receive the knowledge of the past from the snake(s) representing the underworld.

Then consider other symbolism associated with the puma and the snake (See images below). The three zigzag walls could represent the three worlds. Within one of the walls the stones form the shape of a snake. A 340° fault extends from the mullion towards Qoricancha. Qoricancha is located in line with a 340° fault and the

concentrated vein of groundwater it conducts. According to the Spanish Chronicles, Inca legend states there is a lake under Qoricancha. Water is often incorporated into Inca temples and shrines as in the case of Tomb Mochay, which is located near Cusco. Evidence of the fault can be seen along the ravine and walkway that extends along it from the entrance to Sacsayhuaman by the parking lot to the base of the hill. Representatives of the city's water department and local residents told me one of the most reliable wells in Cusco is located at the base of the hill.

The Cusco Valley wall by Sacsayhuaman consists primarily of limestone deposits, which have been eroded with several sections collapsing and sliding down slope. Limestone is susceptible to water erosion which often creates channels within the bedrock allowing precipitation to soak in and groundwater to move along them. Some of the groundwater from the watershed where the mullion is located drains along the 340° fault towards Qoricancha. Could the Inca have perceived the concentrated veins of groundwater as a means of transferring wisdom from the underworld to the present? The walls of Qoricancha are aligned at 340° including the three concurrent windows. Puma Street is in line with the 340° fault and there is an image of a puma standing over a snake along the western wall. Some of the streets between Qoricancha and the mullion such as San Agustin, Herrerias and Palacio trend at 340°. This represents only those features I have had time to locate within Cusco and one must not dismiss the possibility that other features were destroyed by the construction of colonial and modern Cusco.

Taking these observations into consideration, it seems more than a coincidence that these features were aligned in this manner. Perhaps this was a deliberate plan implemented by Inca architects to augment the passing of wisdom from the past-underworld to the present-living world through the snake and puma which then passes it along to the Inca who ruled the Empire from Qoricancha.



Looking towards Baluarte where the zigzag wall is located from the mullion.

Suchuna - The Inca Throne

The actual function of this feature prior to the conquest remains a mystery. Its name is derived from the observation that it resembles a throne. Regardless of its function its location, exquisite design and superbly sculptured surface implies it was important within the environs of Sacsayhuaman.

It is sculptured into the bedrock near the top of the east end of the mullion structure and the middle platform is centrally located at the apex of the fold. If the outcrop represents the back of a snake then the throne is riding on its back. If the imagery of the snake and puma are correct this would be a logical location for the Inca's throne in the natural environment. The throne faces eastward towards the direction of the rising sun, which was of the greatest importance to the Inca. GPS – 13-30-13.5, 071-58-47.8



Throne



Overview



Frontal view



Frontal left



Frontal right

Qocha - Ceremonial Platform and Cemetery – Water Reservoir

Once again the function of this structure depends on the document you refer to. Some identify it as a ceremonial platform, which is very similar to others located throughout the Inca Empire, while others refer to it as a water reservoir used for religious functions and observing the stars. It is located immediately north of the mullion. If the imagery of the mullion structure resembles a snake this structure would be located on its back just before it reaches the surface.

Circular platform



Looking from the slide towards Qocha



Looking from Qocha towards the mullion slide

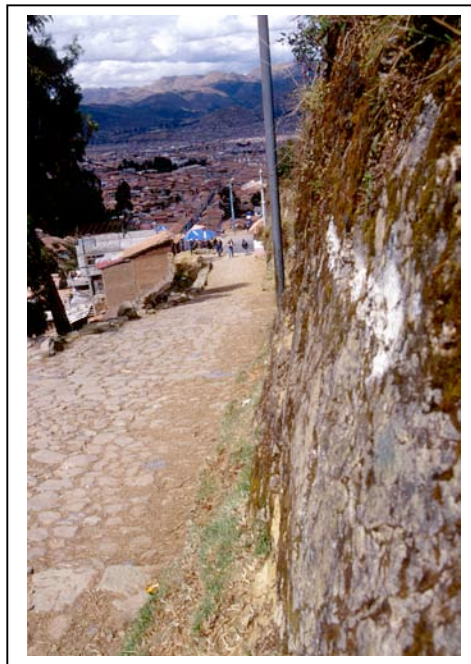
Between Qocha and the base of the slide there is a cemetery

Around the ceremonial platform there are several sections of exposed bedding that have been sculptured into passageways and small platforms.



Location of the 340° fault.

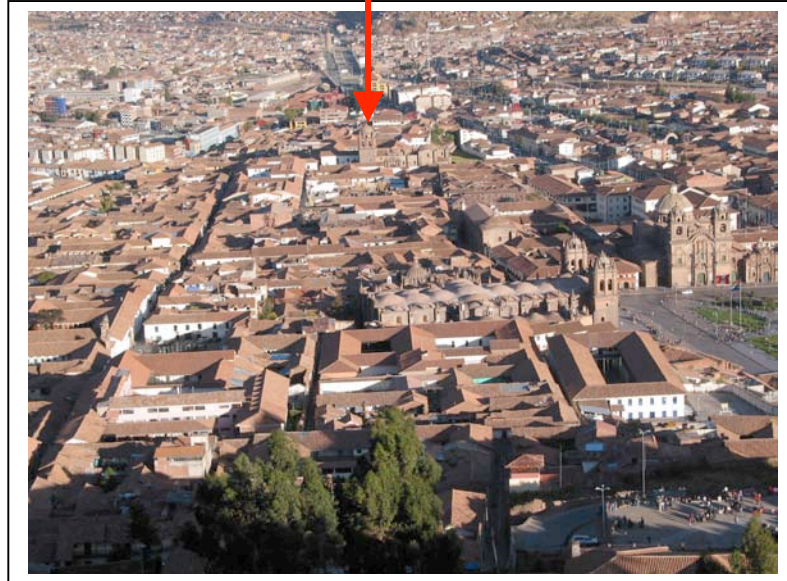
The following view shows the 340° fault's trend looking towards Qoricancha. The fault can be observed along the west side of the walkway within the bedrock.



Looking along the trend of the fault toward Qoricancha.

By standing on the ridge's southern edge near the green cross you can observe the alignment between the mullion and Qoricancha.

Qoricancha

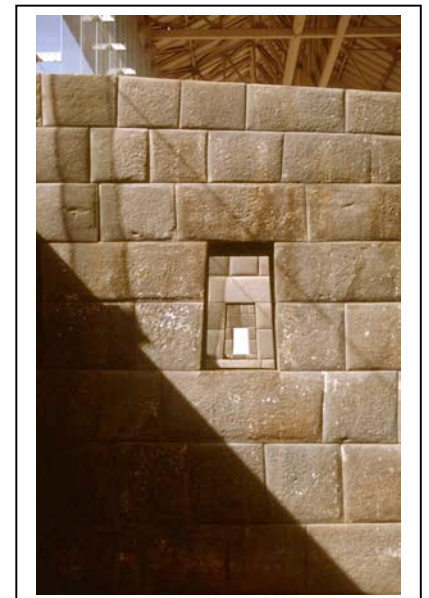


Looking from Sacsayhuaman to Qoricancha

QORICANCHA & SANTO DOMINGO CATHEDRAL

Qoricancha was the Inca palace, however when the Spanish conquered the Inca they built the Santo Domingo Cathedral on the same site. It is centrally located in line with the 340° fault and the concentrated vein of groundwater it conducts.

Window alignment - Some of the most important rooms of the Inca palace still survive within the cathedral. As one enters the cathedral courtyard there is a series of rooms to the left. One set of rooms has a series of windows that are in alignment from room to room in spite of many earthquakes during the last 500 years. These windows are aligned at $340^{\circ}\text{NW}/160^{\circ}\text{SE}^{\circ}$. The distance from one end to the other is 80 ft. They are also in alignment with the 340° fault, the groundwater vein it conducts, the eastern end of Sacsayhuaman, the mullion and the circular ceremonial platform (Qocha) on the north



side of the outcrop.

Qoricancha's walls are orientated at 340° NW on both sides of the central courtyard.

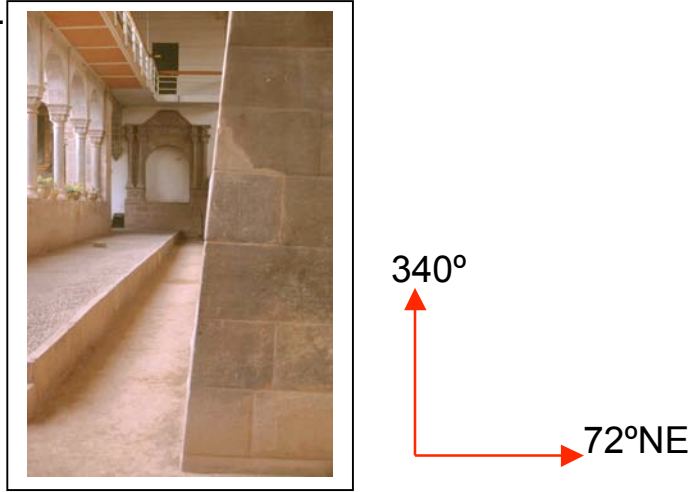
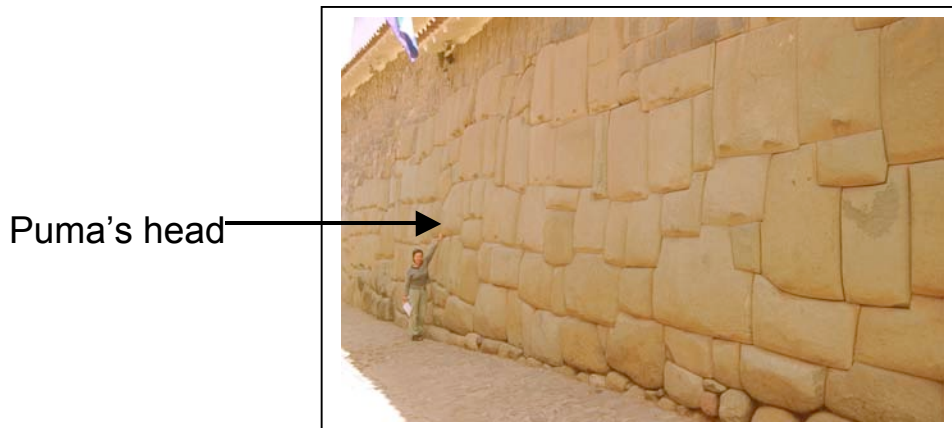


Photo taken along the outer wall with the window alignment

The puma and snake image along the wall on Puma Street.



Puma head



This snake is similar to the one found along the zigzag wall at Baluarte.



Part 2

Concentrated veins of groundwater associated with Sacsayhuaman

During my investigation of Sacsayhuaman, I located four concentrated veins of groundwater. This area has several faults and

the bedrock consists primarily of limestone. Limestone is easily eroded by water thus eventually providing corridors through which groundwater can pass. The fracturing of the bedrock by faults also provided channels for groundwater to flow through. The hills north of Sacsayhuaman constitute a large watershed thus providing water to this region. Large sections of bedrock have eroded from the hills and slid down the slopes forming blocks of limestone. Therefore it would be reasonable to find veins of groundwater passing through the area, which are fed by local precipitation. The four groundwater veins surround the mullion. Veins 9,10 and 11 all merge with vein 8 which then extends to Qoricancha. Could the Inca have perceived these groundwater channels as passing the knowledge of the past to the present? I think it is more than coincidental that these features are connected.

Calculations for veins 8 - 11

Vein 8

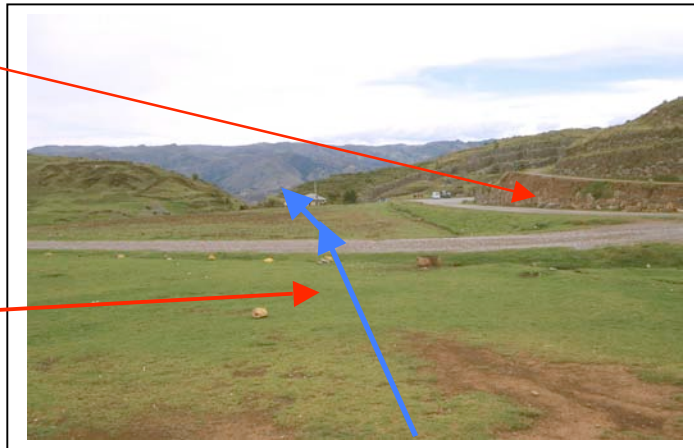
This vein crosses in front of the eastern end of Sacsayhuaman by the parking lot where there is a large open field. Its width was 128.9 m / 423 ft. on July 27, 2003, with a very strong flow. The western boundary is near the entrance gate and the eastern boundary near the bridge where a small stream is located. Vein 8 trends north-south from the top of the ravine located between the hill with the Christ statue to where Sacsayhuaman's walls begin northward. Vein 8 extends across the open field by the entrance gate and continues northward to a ravine located along the slope above the road.

However from where the slope of the hill drops off towards Cusco and a ravine begins, vein 8 trends 160° SE / 340°NW.

Within the ravine on the east side and along the path there is an exposed fault which trends 340°. This is also the direction to Qoricancha, which is explained below.

Top of the Puma's head/
Muyuq Marka .

Course of Vein 8



In addition to vein 8 three other veins are associated with Sacsayhuaman.

Vein 9

Vein 9 extends along the length of the plaza, Explanada, at Sacsayhuaman and merges with vein 8.

GPS – 13-30-16.3, 071-58-50.5 – Near center of plaza

Trend – 103°SE / 283°NW

Width – 46 m

Strong flow

Vein 8



Vein 9

Vein 10

Vein 10 extends along the west side of the mullion right where it disappears into the ground.

GPS – 13 - 30 – 16.7, 071-58-53.6 - where it merges with vein 9

Trend – 17°NE / 197°SW

Width – 13.72 m / 45 ft.

Strong flow

Vein 10

Vein 9



I dowsed between vein 9 and the base of the mullion structure and from vein 10 to vein 8 to determine if any other veins were present and the rods did not cross.

Vein 11

This vein passes along the east side of the circular ceremonial site, (Qocha) and where there are some mummy niches. It merges with vein 8 where the parking lot is located. This is also where the tunnel to Qoricancha is said to be located.

GPS – Center of vein – 13-30-07.8. 071-58-43.4

Trend – 164°SE / 334°NW

Width – 9.75 m / 32 ft.

Moderate cross

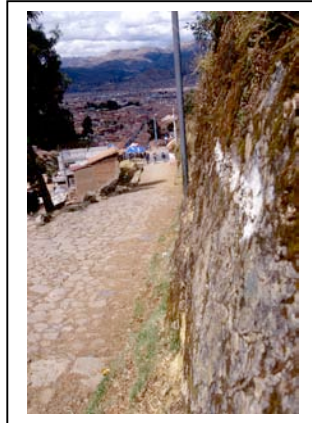


Vein 11

Veins 8,9,10 and 11 surround the mullion. Veins 9,10 and 11 contribute groundwater to vein 8, which eventually passes under Qoricancha.

Vein 8 and the 340° fault in relation to Cusco

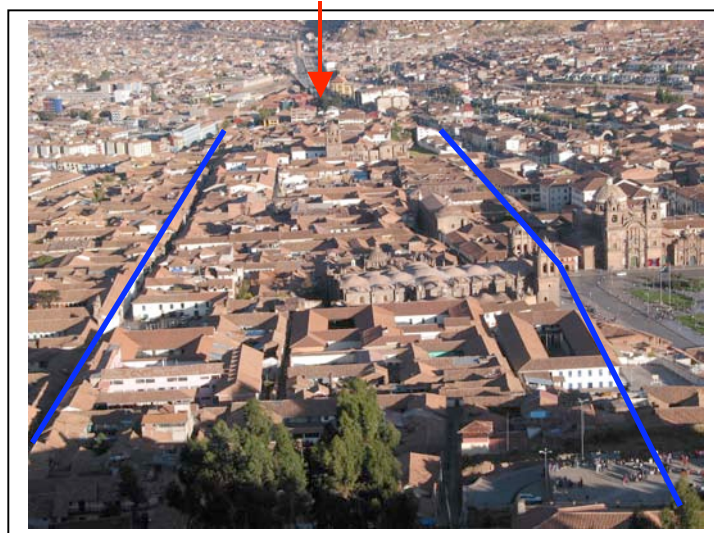
Where vein 8 enters the ravine by Rumipunku its direction changes from north-south to 340°NW and follows a fault trending 340°NW to where it enters the city. Within Cusco there are streets aligned with the east and west boundaries of vein 8 as well as some structures with figures on them. Qoricancha is nearly centrally located on vein 8.



Looking along the trend of the fault toward Qoricancha

By standing on the ridge's northern edge near the green cross you can observe the alignment between the mullion structure and Qoricancha.

Qoricancha



Course of vein 8 from Sacsayhuaman to Qoricancha

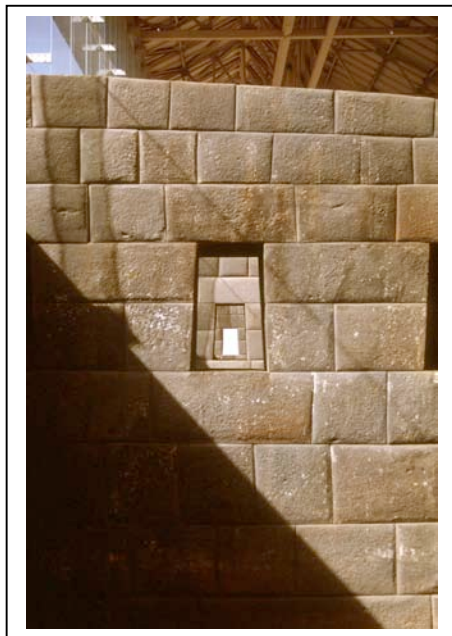
If some of the drawings of Cusco before the conquest are more or less correct, vein 8 passes along the length of the puma from the back of the head to the tail.

QORICANCHA & SANTO DOMINGO CATHEDRAL

Qoricancha was the Inca palace, however when the Spanish conquered the Inca they built the Santo Domingo Cathedral on the same site. Qoricancha is centrally located on the 340° fault and vein 8.

Window Alignment

Some of the most important rooms of the Inca palace still survive within the cathedral. As one enters the cathedral courtyard there is a series of rooms to the left. One set of rooms has a series of windows that are in alignment from room to room in spite of many earthquakes during the last 500 years. These windows are aligned at 340°NW/160°SE°. The distance from one end to the other is 80 ft. They are also in alignment with vein 8, the 340° fault, the eastern end of Sacsayhuaman, the mullion and the circular ceremonial platform (Qocha) on the north side of the outcrop.



Qoricancha's walls are at 340° NW on both sides of the central courtyard.

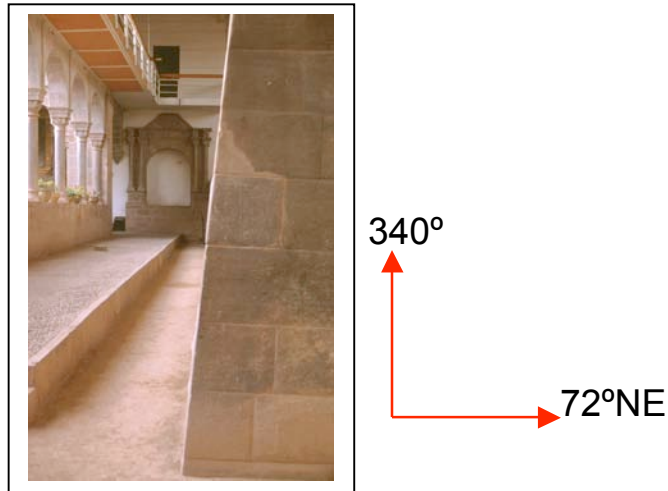


Photo taken along the outer wall with the window alignment

On the west side of the courtyard there is the room with an ornate window located between the two doors. The window is aligned at $72^{\circ}\text{NE}/252^{\circ}\text{SW}$. This is nearly perpendicular to the course of vein 8.



From in front of the Cathedral to the ravine between Sacsayhuaman and the Christ statue the direction is 340°NW . This matches the walls and window alignment with the fault.

Legendary lake

According to the Spanish Chronicles, Inca legend states there is a lake under Qoricancha, however my investigation determined it's a concentrated vein of groundwater, vein 8.

SURVEYING VEIN 8 ALONG THE STREETS OF CUSCO JUNE 25, 2001

From Qoricancha, Pampa del Castello Street extends NW at 330° and becomes Intikijllu Street which then extends to the Plaza de Armas at 330°NW along the western boundary of vein 8. This street is lined with original Inca walls, which suggests this was its original course.



Intikijllu Street

The width of vein 8 extends from Intikijllu Street to San Agustin Street. The width of vein 8 along Mururi Street, which runs perpendicular to Intikijllu and San Agustin Streets, is 580 ft. There are excellent original Inca walls along these streets.



View from San Agustine Street along Mururi Street

The west boundary of vein 8 at the Plaza de Armas is right where Campania de Jesus Cathedral begins. This is the intersection of Intikijllu Street and the Plaza de Armas. The western boundary passes right where the front steps to the main cathedral are located to the intersection of Cuesta del Alminante Street and the Plaza de Armas. From this location northward it is very difficult to follow vein 8 since the streets are very short and curved.

Sunturwasi Street runs perpendicular to vein 8 and it extends from the Plaza de Armas to the fountain at the little plaza where the Centro Artesen building is located. Then the next street begins which is Hathunrumiyuq near the Museo de Art del Arzobispo. This extends to the intersection at Puma Street. The eastern boundary of vein 8 is along Puma Street. Hathunrumiyuq is aligned at 60°NE/240°SW.

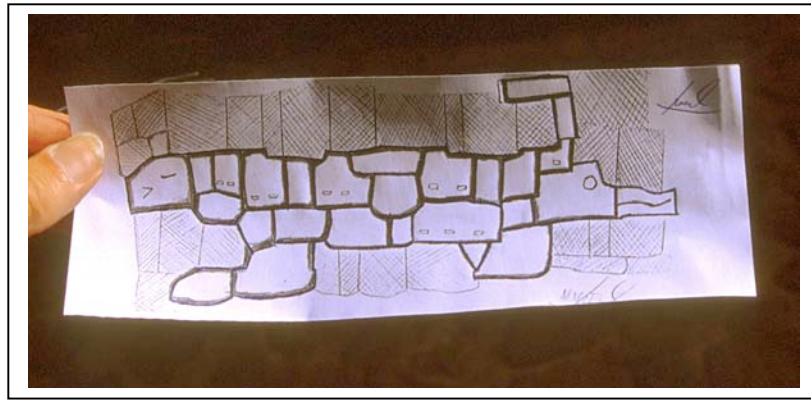
Museo de Art del Arzobispo:

The walls of the Museo de Art del Arzobispo are basically original Inca walls. This was a very important Inca building. It is a city block in size, has several images within its walls and is located along the eastern boundary of vein 8. The puma and the snake are on the back of the building and in front there is a double doorway with two snakes at the top of it.

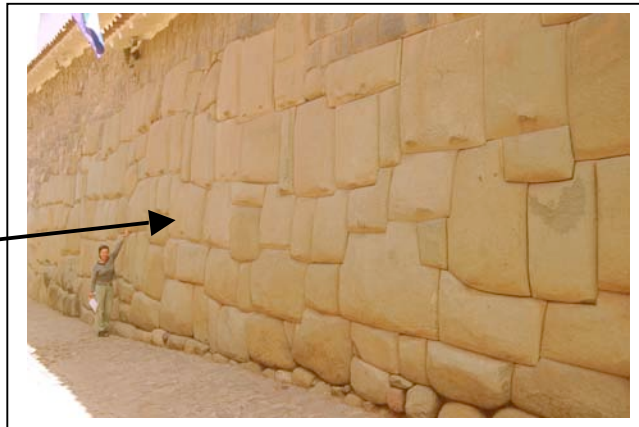
Puma Street

This street is the eastern wall of the Museo and along the eastern boundary of vein 8. Along the street there is an original Inca wall with a large petroglyph consisting of a puma and snake. This image is representative of the imagery associated with the mullion, Sacsayhuaman, vein 8 and the 340° fault.

The puma and snake image along the wall on Puma Street; this is on the eastern boundary of vein 8.



Puma's head



This snake is similar to the one found along the zigzag wall at Baluarte.

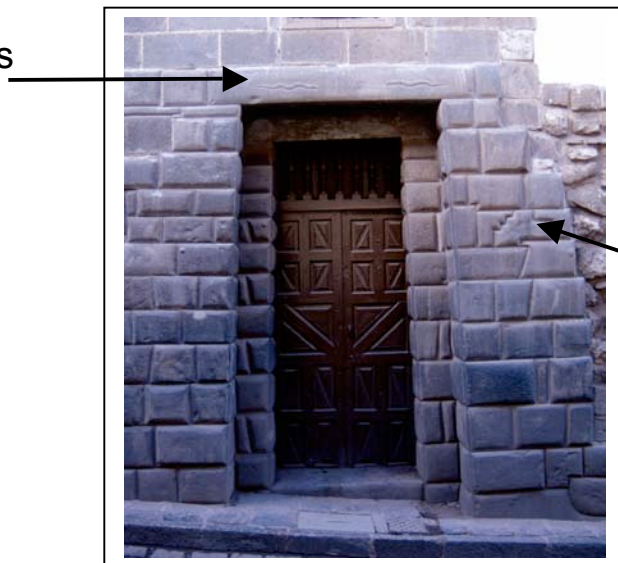


The snake figure is within the circle

[The Museo de Art del Arzobispo has a double Inca door on Herrerias Street](#)

- The door has several markers associated with it including:
- Two snakes facing each other over the door jam
- Four diagonal lines on the left side of inner door
- Two diagonal lines on the right side of the inner door
- A round raised dot on the outer door on each side of the portal
- A 14 sided stone carving

Two snakes



14 sided stone

The 14 sided stone marker

Just a thought - This could reflect the landscape of the ridge from Tambo Machay to Sacsayhuaman.



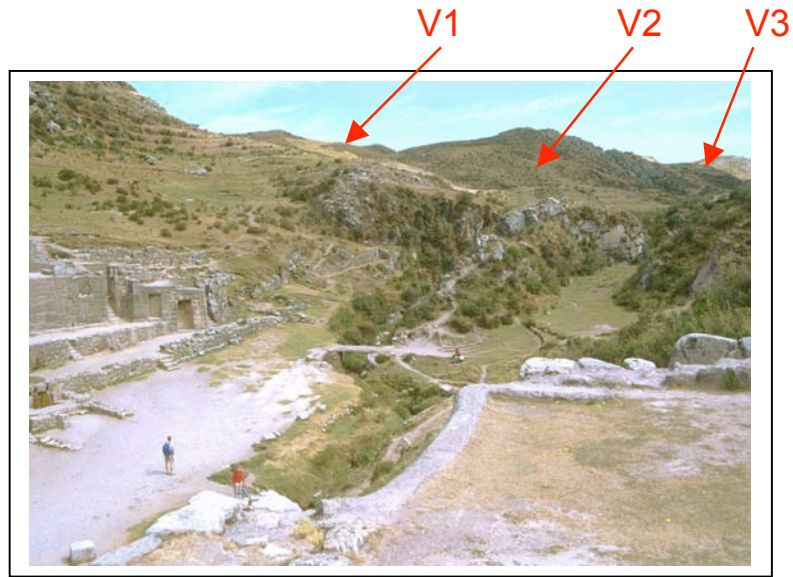
It seems more than coincidence that so many of these features line up with one another whether you include the data gathered by dowsing or not. I believe the Inca identified the geological and hydrological features then placed important ceremonial sites, streets and structures along them. Other sites within the region also suggest this.

THE FOLLOWING SURVEY FROM TAMBO MACHAY TO SACSAYHUAMAN ALONG THE PISAC ROAD WAS CONDUCTED IN JUNE, 2001 AND JULY, 2003

The following observations were made along the Pisac Road between Tambo Machay and Sacsayhuaman. Once again I found groundwater veins associated with each site.

TAMBO MACHAY

This is a well-documented Inca spring, which is located adjacent to a large fault crossing the area. During my survey I located three concentrated veins of groundwater associated with the site.



The spring emerges from the temple's stonewall



Vein 1

It extends along the ravine at $120^{\circ}\text{SE}/300^{\circ}\text{NW}$, is 9.75 m / 32 ft. wide and rods indicated a strong rate of flow. This vein appears to be the one that provides water to the spring.

GPS:13-28-31.8, 071-57-54.9
Elevation: 3,817 m / 12,538 ft.

Vein 2

It is 20.42 m / 67 ft. wide, located in the center of the ravine where the stream is located and trends at 320°NW.

Vein 3

It is located along the side of the ravine opposite the spring where there is a raised platform. The vein is the width of the platform, which is 9.14 m / 30 ft. and the rods indicated a strong rate of flow. It crosses the platform at 320°NW.

All three veins collect groundwater from the slopes above the site and some groundwater could be contributed by a large fault along the slope of the hillside, which trends at 320°NW across the region.

The fault is well documented on the geological map and is adjacent to Tambo Machay. This photo was taken at the entrance to Tambo Machay. Puca Pucara is the structure seen in the upper right.

Fault



Additional Veins of Concentrated Groundwater between Tambo Machay and Sacsayhuaman

These veins appear to receive groundwater from the slope of the hills to the north.

Vein 4

It crosses the road to Pisac where the sign to Tambo Machay is located. It was 69.49 m / 228 ft. wide and the rods indicated a strong rate of flow. It appears to trend at approximately 320°NW.

GPS – 13-28-40.2, 071-57-43.6

Elevation is 3,817 m / 12,424 ft.

Puca Pucara, known as the Inca gate to Cusco, is located there and the vein runs along the eastern boundary of the site.

Vein 5

It is located just southwest of Puca Pucara on the Cusco side. It is 45.11 m / 148 ft. wide with a strong flow and also trends at 320°NW.

GPS – 13-28-50.6, 071-57-38.2

Vein 6

It is located where the access road to the top of Sacsayhuaman turns off the Pisac Road. It is 57.91 m / 190 ft. wide with a strong rate of flow and crosses at 320°NW.

GPS-S-13-29-906, W-071-58-370

Elevation is 3,806 m / 12,490 ft.

Vein 7

It crosses right under Qenko at 330°NW near kilometer post 7. It was impossible to measure the width in a straight line so I followed the curved road to the parking lot. Therefore the width is less than the figure presented by as much as 100 to 150 ft. In June 2001, it was 171.3 m / 562 ft. and 164.6 m / 540 ft. on July 27, 2003 with a strong flow both times.

GPS – 13-30-19.1, 071-58-06.6

Qenko

Qenko was an important religious site for the Inca. Although some of the features were used to determine the seasons other features remain a mystery. The site is cut into limestone bedding.

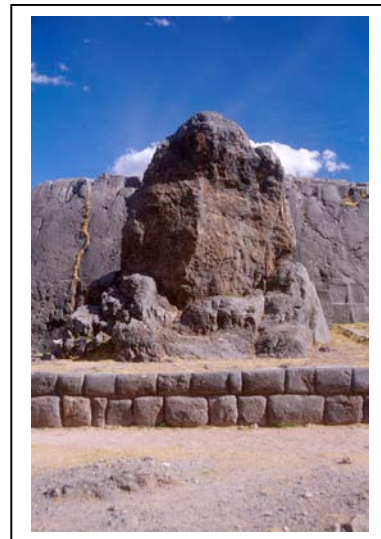
Toad



Overview of Qenko



From the side



From the front

The Toad

There is a large vertical stone in front of Qenko that is said to represent a toad. When I examined it I had to agree that it looked like a toad from the front and side. The toad is standing on his hind legs with its forearms reaching up to the sky. It faces 30° N. The toad is said to be associated with rain and water and is nearly centered on vein 7.

GPS – 13-30-19.6, 071-58-06.8

On top of Qenko there are numerous sculptured features, which need to be examined in great detail. Perhaps someone else has done this already. I would like to know what they found.



Examples of some of the sculptured features

One of the features consists of two short round columns. The columns in conjunction with other nearby features indicate when the summer and winter solstices occur.

During my investigation I realized they are aligned at 50°SE / 330°NW which is the same trend as vein 7. They are located directly above the chamber which contains an altar aligned at 50°SE / 330°NW.



50°SE / 330°NW



The platform is aligned at 330°, and is directly below the two columns on top of Qenko.

On top of Qenko there is a zigzag trough cut into the rock. According to the legend the Inca poured blood into the pool at the top and as the blood flowed down the trough it would enter one of two additional channels. One channel represented bad weather and the other good weather thus determining if they would have a good or bad year.

When I examined it I could not help but wonder if this did not have something to do with a river or watershed. Perhaps the niches represent the watershed within the region of Cusco as well as places to set mummies. I was there when it rained in 2001 and that is exactly what came to mind. The surface of Qenko is similar to a stone marker in Ollantaytambo.

Bottom

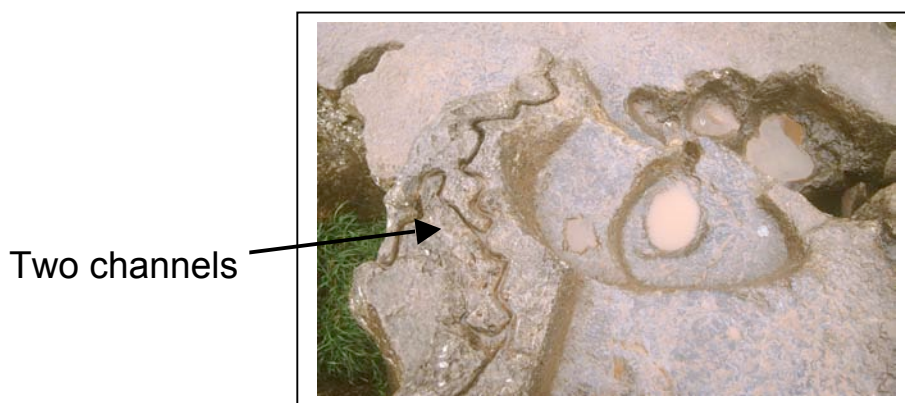


Top

The trough



Top



Two channels

Bottom with two channels

Conclusion

After examining the various archaeological sites in Cusco, I believe the Inca were very aware of the relationship between geology, hydrology and archaeology. Throughout this survey archaeological sites were associated with geological features and concentrated veins of groundwater. Like the Nasca the Inca mapped the location of geological features and the course of concentrated veins of groundwater however they used a different format than the Nasca. Rather than geoglyphs the Inca used important structures, ceremonial sites and stone markers to identify where the groundwater veins snaked their way through the bedrock and alluvial deposits.

It is hard for me to believe the Inca would not have recognized the uniqueness of the andesite mullion structure, which is located in

what the Inca considered the center of their empire. A coincidence? Nor does it seem likely the location of the puma's head, as proposed by some researchers, in relation to the mullion is contributed to coincidence. The symmetry of Sacsayhuaman is as awe inspiring as the mullion itself making it equally unique to the Inca Empire. It surrounds the mullion with the most magnificent walls and important ceremonial sites within the empire as if it were a testimonial to the importance of this site within their culture's beliefs.

It is equally hard for me to believe the Inca randomly chose the site of Qoricancha, orientated its walls at 340°NW and ended up placing it on a fault, which conducts a concentrated vein of groundwater that drains Sacsayhuaman.

Then there is the reoccurring imagery within the structures reflecting the mythological imagery exemplified by the snake passing under the puma. I envisioned this symbolism before I learned of the image along Puma Street and within the zigzag wall at Sacsayhuaman. The alignment of streets, walls and the location of important structures within Cusco consistently correspond to the orientation of the mullion, the 340° fault and groundwater vein 8. This suggests the Inca carefully orchestrated the placement of structures with the andesite mullion in mind.

I believe the data presented in this report represents only a small portion of those features within the Inca Empire that relate to this geological feature. I hope future surveys will consider this data and conduct a more comprehensive investigation of these observations and features, if you do please share your data with me.

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