Tizayuca: A Case Study of Embedded Stones

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By Samantha Newmark, Class of 2010

“Oh God, O father in heaven, you glorify this multitude of flowers.

Only in Your shadow, yonder only, can there be a shelter.”

-Cantares Mexicanos 189

Introduction:

The church of La Transfiguración Tizayuca in the state of Hidalgo, Mexico, is one of many examples of churches built in the sixteenth century containing pre-Columbian or early colonial carved stones embedded in the walls. Wake, who has done most of the research on embedded stones, defines them as “small, single stones bearing a carved motif or design,” “embedded into the exterior walls of many sixteenth-century churches and monastery buildings” (Wake 247). It is believed that a large majority of these stones were taken from pre-Conquest structures and placed, often with considerable care in the Colonial buildings, perhaps in an attempt to maintain the imagery of the pre-Colonial period (Wake in press). As can be seen on Mexican buildings such as the Templo Mayor, the embedded stones decorated temples and other edifices before the coming of the Spaniards.

Most of the embedded stones found on the churches depict pre-Colonial symbols of the Aztecs and surrounding peoples, a majority of which appear linked to water or fertility (Wake 250-251), an idea which is supported by flower motifs on the church at Tizayuca. Tizayuca is an important example because of both the number of visible stones and the clarity of those stones – only one of nineteen is eroded to the point of hindering identification. There are other stones, however, of distinctly post-Conquest origin (Wake 250-251). For more information on embedded stones in general and the history surrounding the current research, see Wake’s book, Framing the Sacred (in press).

This study focuses on the stones found on the walls of the church at Tizayuca. I will first discuss their iconography. I believe I have identified Mexican flowers directly tied to two of the stones. This will lead to a discussion of the flower gods and flower-related festivals. Next, I shall enumerate the ways in which the stones and the church may be connected to celestial constructs. Finally, I shall draw conclusions regarding the placement and function of the stones based on the flower symbolism and celestial correlations.

Basic Data:

There are nineteen embedded stones on the walls of the church at Tizayuca (Table 1). They appear on the walls faces as well as on pillasters and other architectural structures jutting out.
from the walls thereby allowing for differing directional alignments on each wall. The designs carved on the stones are also varied. Flowers are the predominant motif by far, with fourteen of the stones depicting floral symbolism. Within this broader category, there is also much variation. The most prevalent stone is a five-petaled flower with a well-defined ridge on the petals (For details, see Figure 4). It also bears a carved central circle. This particular form of flower is found six times on the church, and all examples are located on corners, either of the body of the church itself, or on rectangular pillars jutting out from the main façade. There is also a single six-petaled flower, with six undecorated, overlapping petals, and a carved central circle. There are three eight-petaled flowers as well (Fig 4). These have a defined center and a depressed line at the center of each pointed petal. They are also unusual in that they are all portrayed as split in two. Interestingly, bifurcated symbols are common in the codices. Two of the three stones have both pieces portrayed, with each piece on the opposite side of the stone than where it should fall were it whole. They are not split into equal halves, but instead two pieces of different sizes that vary among the examples. Though split, they are obviously not damaged, with the two parts depicted on opposite sides of a single stone. One of these can be found on a basin apart from the wall, which can be discounted from analysis due to obviously modern placement. The other entire flower appears on the western façade. The last is only half of the motif, on one of the sides of the irregular pillar on the east wall.

Another floral design found on the church is that of the xochimecatl, or flower-rope (Figure 1). There are three such forms on the church clustered near the center of the north wall, appearing as woven ropes interspersed with four-petaled flowers. There is one stone located very high on the northern wall that may be a more modern carving. It is a seven-petaled, etched flower with the stem depicted along with the blossom. Because of the disparity in graphic elements, and more importantly because it is cut almost in the manner of graffiti, it is not included in the list of Colonial embedded stones. There are other examples of modern carved ‘graffiti,’ some of which were located very high on the walls as well. The last stone is eroded and its motif is unclear. It sits on the western wall, and seems to be a flower because of the clearly defined central ring some remaining visible impressions that appear to be petals forming an outer ring.

There are also five stones at Tizayuca that do not follow the overall flower motif. One of these stones may be related to the flowers, though it does not appear to directly display one (Fig. 2). The stone itself is triangular, and appears to depict a tripod vessel portrayed in the manner of the foaming pulque vessels of the Mixtec codices. That it may be a pulque vessel is supported by its presence on the northern wall near the xochimecatl, which were also used in ceremonial settings.

Another set of stones which does not portray flowers are “studs,” as Wake (p.c.) calls them, on the irregularly angled buttress at the southeast corner of the church. There are three such
embedded stones, two depicting one stud and the third with two studs. These studs appear as carved knobs within a carved depression. Their meaning eludes me and I have found no pictorial evidence of decorations in this style in the codices, on buildings, or anywhere else. They could represent a count, but this does not seem likely due to the low numeration (one or two) and their placement. The last stone is one of obvious post-Conquest origin. It depicts the Keys of St. Peter crossed behind a papal miter. The stone is located on the western façade near the northern corner, facing west.

Flower Symbolism:

One goal of this study is to identify the floral symbols through the use of native documents and texts on Mexican botany. In Nahua thought, flowers were laden with multiple meanings. They represented fertility and sexuality, beauty and social status (Miller 213). They served as a link between humans and the gods: “The Giver of Life invents them, he has sent them down” (León-Portilla, 98). Additionally, they evoked ideas regarding the brevity and preciousness of human life, as in the statement “the body makes a few flowers/and drops away withered somewhere” (Kissam and Schmidt 47). Finally, flowers were seen as a symbol of blood spilled on the battlefield (Miller 213). In the Florentine Codex of Sahagún, statements and pictures regarding flowers are scattered throughout the pages, and a large section of Book 11 is dedicated to descriptions of various types of flowers and flowering plants. For example, one warrior (Sahagún 1590, 103) bears an eight-petaled flower on his shield which looks very much like the eight-petaled flowers of Tizayuca, except that the flower is whole rather than split. In the Vienna Codex, the xochimecatl is depicted (Fig 1), portrayed in a similar way to that on the church, though the Vienna rope is coiled (38).

The symbol of the xochimecatl (Fig 1) was important in Nahua thought. Woven cords were thought of as symbolic for the fusing of opposing concepts, such as night and day, time and space, end and beginning, and death and birth (Klein 15). It was also believed that ropes connected the world and the heavens. Klein remarks that: “The nexus of the universe is often described as a flowering tree of abundance where, according to one Aztec poet, ‘there interlocks the thread of our life’” (17).

Flower Identification:

As one might expect, there appear to be real models for the flowers portrayed in stone at Tizayuca. The five-petaled flower could be the Turbina corymbosa, or morning glory (Fig. 3). This flower was depicted on a statue of Xochipilli, the Flower Prince (Schultes, Evans, Hofmann, and Rätsch 62-63). While the flower on Xochipilli and that on the church are not identical, they do have several distinct similarities such as the five clearly-defined, rounded petals and the circular center. Both also have other elements on the petals (Fig. 3). The Tizayuca carving displays rims around the petals and the statue exhibits a ridge in the center of each petal. The
morning glory was significant to the Mesoamerican peoples because the seeds were used as a hallucinogen known as Ololiuqui (Schultes, Evans, Hofmann, and Rätsch 170, Heyden 22).

Two other possible identifications for the flowers can be derived from Sahagún’s description of the ceremony of Tlaxochimaco (Sahagún 1982, 108). He lists the many flowers which the people would find before the festal day. Sahagún says that the people would find dahlias, hummingbird flowers, tagetes, ranunculus, bocconias, tiger lilies, plumerias, didymeas, forest magnolias, talaumas, earth plumerias, lobelias, water lilies, and castalías (Sahagún 1982,108). One of these is the five-petaled flower Plumeria acutifolia, called the earth plumeria by Sahagún. This flower has petals of a similar shape to the five-petaled stones on Tizayuca and a yellow inner ring (Figure 3). The color change from yellow on the inside to white on the outer petal appears to be represented stylistically in the carved rim on the Tizayuca stones, which defined rim is lacking in the flower itself.

The other flower of interest in this listing is the Dahlia cocinea which has eight petals (Figure 4). This flower is almost identical to the bifurcated flowers on the church, with its eight pointed petals ribbed in the middle. It also has a defined circular center as does the flower on the church. Dahlias are native to Mexico and widespread, particularly in the mountainous regions.

Flower Deities:

The Aztecs of Tenochtitlan also tied flowers to their rituals and religion in more direct ways. Two of their major deities, the twins Xochipilli and Xochiquetzal, were associated with flowers. They had several festival days which were specifically dedicated to either of these gods. On those days and most other festivals, flowers were used in a variety of ways, from garlands to part of the sacrifice itself.

Xochipilli, the Flower Prince, is the god of the fertilizing sun, the arts, dancing, feasting, flowers, and pleasure. He punishes those participating in sexual excesses with hemorrhoids and sexually transmitted diseases (Aguilar-Moreno 152). His demesne overlaps with that of Macuilxochitl, Five Flower, and they are frequently treated as the same entity. Macuilxochitl is one of the Ahuiateteo, the Gods of Pleasure who represented the dangers of excessive debauchery. The number five was associated with all of these pleasure deities because it was the symbolic number of excess (Aguilar-Moreno, 147). Macuilxochitl is associated with flowers, and is the patron of gambling and games. The name Macuilxochitl was also used to refer to the sunflower (Heyden 16). He punished wrong-doers in the same manner as Xochipilli (Aguilar-Moreno, 149). Macuilxochitl, along with the other Ahuiateteo, is associated with the south (Aguilar-Moreno 147). Thus, he is shown as the deity of the south in the quadripartite world diagram in the Borgia Codex (Durán 243, footnote 4).

These associations between Xochipilli/Macuilxochitl and the flowers

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188 These names are Dibble and Andersons’ translations of the original Nahuatl flower names.
bring up an interesting possibility regarding the meaning of the embedded stones on the church walls at Tizayuca. There are many connections between this double-aspected god and the five-petaled flower. First, the stone flower may represent the same morning glory blossom portrayed on the statue of Xochipilli. Here might be a native ceremonial element adorning the walls of Christian ceremonial space, as the figure in the statue of Xochipilli is identified as being in a shamanic trance (Aguilar-Moreno 195). Another detail relating the aforementioned flower on Tizayuca to the Flower Prince is that the carved flower itself has five petals, the number of excess which is also in Macuilxochitl’s name. Finally, and again concerning directionality, it is important to note that all of the five-petaled flowers were found on the north-south axis of the church, with most pointing towards the south. This could be related to Macuilxochitl’s association with the south. Thus, it seems as though apart from the obvious association of flowers being related to the Flower Prince, there is strong evidence to link the flowers of Tizayuca, and particularly the five-petaled flower, with Xochipilli, his alternate identity Macuilxochitl, and all that they represent.

The second deity associated with flowers in the Aztec pantheon is Xochiquetzal, or Flower Feather. Xochiquetzal is the twin sister of Xochipilli. She represents feminine crafts and holds sway over fertility. She also is a patron of the arts, and physical pleasure. She is the goddess of sexual love and the female sexual power, of childbirth and young mothers (Aguilar-Moreno 152). Several festivals were associated with her, and she was considered to be one of the mother goddesses of the Aztec pantheon, as well as being the patroness of weavers (Klein 1), which may tie her to the xochimecatl rope on the northern façade of Tizayuca. There is a six-petaled flower portrayed on a statue of Xochiquetzal (Solis 188), similar to the one on the church at Tizayuca.

Flower Festivals

The two flower deities, Xochipilli and Xochiquetzal, offer a gateway to investigating flower-related rituals. While most ceremonies used flowers in some aspect of the rites, several of them specifically honored flowers or the gods dedicated to them. Given the dates of these flowery festivals, one can attempt to connect the embedded stones to the natural world by examining alignments of the church to the movements of the sun and other celestial bodies. Eight feast days, each attached to an eponymous month, could be tied to flowers: Tititl, Xiutzitzquilo, Tlacaxipehualiztli, Toçoztontli, Tecuilhuitontli, Tlaxochimaco, Ochpaniztli, and Tepeihuitl.189

Tititl took place between January 23 and February 12.190 It was the “run for the flowers,” mentioned in Book Two of

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189 All of the dates given in this section are in the Gregorian system, although they were converted to the Julian system for precision in Colgate University’s Ho Tung Visualization Lab. Dates are based on modern correlations by scholars such as Aveni.

190 I’ve chosen to organize the festivals based on placement in the European calendar for the original ease of changing the date in the Visualization Lab.
the Florentine Codex (157). On this festival, flowers were placed on the tops of pyramid-platforms, and the impersonators of gods would race to attain them. It was also a festival associated with the weavers, possibly tying it to the xochimecatl as well as the other flowers on the church (Sahagún 157).

Xiutzitzquilo took place between February 12 and March 4. Durán gave the date as March 1. This festival was the first of the year, and Durán defined it as “Taking the Year in One’s Hand” (412). One custom practiced on this day was to touch bouquets: “Old and young men and women would sally forth to the country... to touch with their hands the herbs and plants born on the new year” (Durán 413).

Tlacaxipehualiztli, the “Flaying of Men” took place March 4 through 24. This festival was celebrated to honor Xipe Totec, the Flayed One, who was a god of vegetation and the sun (Aguilar-Moreno 295). It was more generally a rite celebrating the renewal of the earth. Durán says that the people impersonated several gods on that festival, including Macuilxochitl, Mayahuel, the goddess of pulque, and Ixtliltzin, one of the four hundred gods of drunkenness (Durán 175). Mayahuel and Ixtliltzin are significant to Tizayuca because of the pulque vessel depicted on the church. The victim for Tlacaxipehualiztli also drank pulque before the sacrifice (Durán 178). This victim was tied to a rope coming out of a “stone spindle,” which connected him with a symbolic umbilicus to the universe (Klein 17).191

Toçoztontli took place between March 24 and April 12. It was also called Xochimanaloya, the offering of flowers (Aguilar-Moreno, 295). On this day, the first flowers of the year were offered. Sahagún describes a prohibition regarding flowers thus: “And before they had offered them, none dared to smell a flower” (Sahagún 1982, 5). The flowers that were collected were woven together in a chain.

Tecuilhuitontli was celebrated from June 12 through July 2. This “Small Festival of the Lords” honored Xochipilli (Aguilar-Moreno 296). On this occasion, there was great ceremonial drunkenness, and dancers were joined together with xochimecatl (Sahagún 1982 13, 93). Flowers were also painted onto the body of one of the impersonators, and held aloft during the ceremonies by commoners (Sahagún 1982, 92-93). Regarding it with seeming unimportance, Durán says that the day was “just an occasion for enjoying the flowers which abounded in that season” (434). Probably, the festival was not so minor given the deep-seated attachment the native peoples felt for flowers. Durán conflated this ceremony with another important flower festival, Tlaxochimaco (434).

Tlaxochimaco marks the “Birth of Flowers” (Aguilar-Moreno 296), or the “Distribution of Flowers” (Durán 434). It took place from August 11 through August 31. Flowers were given to Huitzilopochtli on this day, and they were used to decorate effigies of the god (Sahagún 1982, 13). The people also went out several days ahead of time to gather flowers to string into garlands. These

191 Interestingly, this festival date has also been tied to the orientation of the Templo Mayor (Aveni and Gibbs).
garlands were then treated with the utmost reverence until they were actually offered to the god. Included within the flowers gathered by the people were the dahlia and plumeria acutifolia (Sahagún 1982, 108) that are likely portrayed on the church at Tizayuca.

Celebrated from September 20 through October 10 was Ochpaniztli, identified by Durán as the Feast of Xochiquetzal or Xochihuitl, the Feast of Flowers (Durán 238-239). This was a celebration of the last flowers of the year. The people would smell the flowers as a remembrance of the fruitful season (Durán 238). There was much dancing on this festival day, and it was said of the dancers that “they went in various rows as hath been said; they moved like flowers. They indeed went in glory” (Sahagún 1982, 123). Durán describes the way in which the people would smell the last blossoms, saying that “They find the smelling of flowers so comforting that they even stave off and manage to survive hunger by smelling them” (Durán 238).

The final flower-related ceremony is Tepeilhuitl. It took place from October 30 through November 11. This festival, dedicated to mountains, honored Xochiquetzal. An impersonator of Mayahuel was sacrificed, were deities known as Xochtectl and Tepexoch (Sahagún 1982,132). While I am unsure of who the latter gods are, their names both include “xoch,” which means flower. Also honored on this day were two other pulque deities, Tepictoton and Octli (Aguilar-Moreno 297).

Flowers and the Sky: Some Possible Celestial Correlations:

Very little was written on the cosmos by the chroniclers, despite the apparent attention paid to it by the natives. Sahagún displays panels depicting Aztec constellations. However, he did not set them within the larger context of where they appeared in the sky nor did he attempt to relate them to religious rites. No chronicler has definitively mapped out the Aztec sky, either in its own context or in comparison to the European constellations. Some work has been attempted nevertheless (Aveni, Coe, Seler). I have used this material together with my own observations as a basis for assigning importance to various stars and constellations as they relate to flower festivals.

Having found connections between the native festivals and flowers, I examined possible related astronomical events in the Colgate University Ho Tung Visualization Lab. My examination, using a planetarium that offers the ability to examine celestial objects in any time period, in this case AD 1500, and as viewed from any location (20° N latitude), turned up several interesting alignments. Admittedly, some of the alignments may be merely coincidental.

To better judge this potential, I specifically sought any stars or constellations that underwent heliacal risings or settings on the important festival dates. There are four possible heliacal events for stars. A star can rise in dawn’s first light, approximately 45 minutes before the sun is visible, which marks the first time it will be visible in
the early morning hours. A star setting opposite the sunrise in the same time frame will be in its last morning appearance. At night, a star may rise approximately 45 minutes after sunset, marking its first nighttime appearance. The last nighttime appearance is when it is visible for only a few minutes after true dusk. In all of these cases, the sun will be approximately ten degrees below the horizon. Along with the festival days enumerated above, data was also gathered for dates of possible importance, such as the solstices, equinoxes, zenith passages, and the Catholic festival of the Transfiguration of Christ, to which the church was dedicated. The purpose of examining solar and heliacal rises and sets on these days was to see if there was any correlation of the church’s alignments with them. Sunrise and sunset were marked at the point at which the sun is first visible or last seen above the horizon (Fig. 5).

While we do not know all of the constellations identified by the Aztecs, we do have hints of some, gleaned from a diagram in Sahagún’s Florentine Codex. One constellation, called Tianquiztli or the marketplace, is almost definitely the Pleiades (Aveni 33). The Western constellation of Orion’s Belt is most likely Mamalhuaztli, the Fire Drill (Aveni 35). Another constellation, Xonecuilli, might be either the Big or the Little Dipper. It is also possible that it could have been associated with the Southern Cross (Aveni 36-37). Citlalcolotl, the Scorpion, may actually have been the same constellation as our Western Scorpio, though Coe points out that this association could have been due to the blending of information from after the conquest (cited by Aveni 37). In addition, it is likely that they also recognized other bright stars, though this is not corroborated by the ethnohistoric record.

Because of the presence of the keys depicted in a colonial embedded stone on the western facade of the church at Tizayuca, I have added to this list of observed constellations the European asterism, the Keys of St. Peter. The stone depicting the Keys of St. Peter lies on the north-west corner, facing west (Figure 5). Along with being an emblematic Catholic design, the Keys of St. Peter was a medieval constellation connected to the larger constellation of St. Peter himself. There is some controversy as to where the Keys actually lie in the heavens. Coe cites the Keys as being analogous to the Western constellation of the belt and sword of Orion, which was also the native Fire Drill (26). Other scholars, however, such as Eduard Seler, give a different location for the Keys of St. Peter. He places Keys of St. Peter within ι Muscae and α and β Arietis (Seler 357). He argues that this constellation was also recognized by the Aztecs, who called it “the bringer of the night” or “the lord of the night” (Seler 357). Another possible situation of the Keys of St. Peter in the sky is 35, 39, 41 Arietis and 12, 13 Trianguli (Aveni 35). This was the location observed in the Visualization Lab, and not too far from Seler’s placement (Figure 6).

The Keys of St. Peter have been an important symbol of the Papacy dating back at least as far as the 12th century (Levillain, 689). The Keys might appear portrayed in many ways, including with a
papal tiara, as they are shown on the stone at Tizayuca. They came into use as a symbol because of a line from Matthew 16:19: "I give you the keys to the Kingdom of Heaven" (Fleming, 205). Only one key was shown in early iconography. By the Middle Ages, however, the convention was to show two keys, usually one of gold and one of iron. As Milton later wrote of the keys in "Lycidas," "Two massy Keys he bore of metals twain/(The Golden opes, the Iron shuts amain)" (Milton p. 123, ll. 110-111). While as mentioned above, they usually symbolized the Papacy, they were also used elsewhere in Christianity, as in the Puritan Milton’s writings (Fleming 205-206).

**Interpretation:**

Several of the stars and constellations undergo heliacal events that correspond to the dates of the flower festivals and other significant days in the environment of Tizayuca; these events would have been recognized by the colonial Aztecs. Orion’s Belt and Sword (the Firedrill) rises between the two prominent hills of the East before the sun on the Tecuilhuitontli festival. Castor and Pollux also appeared frequently at Tizayuca in heliacal events. Finally, the natives of this period would have likely seen the Keys of St. Peter, or at least the Spaniards commanding the building of the church would have been aware of them.

How frequently the star events occurred is another concern. Three stars matched three of the possible four heliacal events within the relevant festival and calendrical days. Regulus, Arcturus, and Castor and Pollux (counted as one due to proximity) all had three heliacal events on these days. One, Denebola, even went through all four. See Table 2 for details.

Five of the seven flower ceremonies had at least one event involving the major four stars identified above. All of the six other calendrical days had at least one of these events. It is notable that Castor and Pollux may have been part of the native Ballcourt constellation. This raises the likelihood that the Aztecs would have recognized the stars as significant. Though the other stars are not noted in the ethnohistoric record, their frequency of alignment and prominence in the sky suggests that the correlations may not be merely accidental.

Finally, given the prevalence of astronomically aligned pre-Columbian architecture in Central Mexico, I examined whether the rise and set positions had a connection to the orientation of the church. The four walls of the church are aligned to 18° north, 108° east, 198° south, and 288° west. The door is on the western façade. There are several instances in which an astronomical event occurred within only a few degrees of the east-west axis, and a couple of other events that had other significance.

The sunrise on the festival of Tititl, at 105°, occurred along the axis of the church, at the apse end. On the winter solstice, sunrise was at 116°, also very close by. Sunset on the zenith passages occurred at 290°, which would

192 All degree measurements are using the azimuth scale, where north on the horizon is marked as zero, east is 90, and so on. This system notes both the church directions and the positions of the stars.
have resulted in the setting sun being visible in an almost direct line from the doorway.

Several stars also set almost exactly along the western axis of the church, close to 288°. Interestingly, these aligned stars overlapped with the stars of the greatest frequency: Regulus set at 284°, Denebola set at 287°, and Arcturus at 292°. This again suggests that the alignment was more than coincidence. The Keys of St. Peter set at 298°, within 10° of the axis of the church. The stone depicting the Keys of St. Peter, however, is closer to the northwestern corner of the church, putting it almost directly in line with the setting of its celestial likeness. Regulus also rose at 78°, which fell very close to the northeastern corner.

Also of note is the alignment on the Christian festival of the Transfiguration of Christ. The constellation of the Keys of St. Peter can be seen at the zenith (the highest point in the sky) immediately before sunrise. Perhaps this gives some insight into why the church was dedicated to the Transfiguration, and why the symbol of the keys is so central.

The various astronomical alignments occurred on four of the seven flower festivals, all of which also had a frequent star event. In terms of the calendrical events, the alignments occurred on the winter solstice and the two zenith passages.

Conclusions:

The object of this research was to identify the symbolism used in the embedded stones, and finally to ascertain whether or not the embedded stones had a significant placement on the church.

The first conclusion is that the embedded stones on the church are related to the flower gods and their seasonal feasts. As I have shown, there is a relationship between the five-petaled flower, the most frequently-occurring motif on the church, and Xochipilli/Macuilxochitl. All of the flower motifs can also be related to the festivals themselves. Both the five-petaled and eight-petaled examples can be identified as native species used in rituals. In addition, pulque vessels were also ceremonial in nature.

The astronomical evidence further links the flower rites to the church. It is also significant that the people of the region recognized at least one of the constellations identified. In respect to both alignments and star event frequency, over half of the flower rituals produced positive results, and there was significant overlap between the frequently-occurring stars and those we know were recognized by the indigenous people.

The second conclusion is that the church itself was aligned in a significant way. Many stars and solar events are in line with the major axis of the church as enumerated above. However, one cannot determine exactly which celestial body or bodies determined the alignment. Perhaps the fact that all four setting events (Denebola, Castor and Pollux, Regulus, and Arcturus) occurred close enough together to use as a marker, rather than a single event being used.

The third conclusion is that the stone depicting the Keys of St. Peter and its celestial counterpart do appear to
have been intentionally aligned. They are aligned about ten degrees off of the western axis of the church when they set, pointing almost directly at the eponymous constellation. There is always the possibility that this could have happened by chance, but the convergence of a symbol in stone, an astronomical tradition, and an alignment with a constellation seems too perfect for mere coincidence. Its intentional placement is also supported by the fact that it appears to be a commemorative stone from an earlier colonial building, and then transferred to the present church. Of all the possible locations on the large church at Tizayuca, it ended up aligned with a constellation which represents the same idea as the stone. At another church, that of San Bartolo Tenayuca, both the church itself and a stone depicting the Keys of St. Peter are aligned to 294.3°, fewer than five degrees away from the azimuth of the star. San Andrés Mixquic, also adorned on the western side with the Keys, is aligned to 280°: still fairly close to the setting point of the celestial Keys.

The fourth and final conclusion of this investigation is that the precise placement of the stones shows no intentionality, with the one exception of the Keys of St. Peter. The biggest piece of evidence against any correlation is the northern façade. With seven stones, it has the most carvings on a single surface at Tizayuca. However, nearly all of the stars visible in the north are circumpolar, or at least don’t have obviously significant instances of rising and setting events. Likewise, there were no major features in the landscape within a reasonable distance toward which lines extended from these northern embedded stones could have pointed. This suggests that the stones on the northern wall point towards nothing in particular.

Likewise, there was no outstanding feature in the celestial or nearby geographical south towards which the four south-facing five-petaled flowers could have pointed. The intercardinal stones and the floral stone pointing east likewise do not appear to align with anything. Finally, on the western side, there are two stones other than the one depicting the Keys of St. Peter in approximately the same area of the wall. One, an eight-petaled flower, could be discounted from pointing to any of the sunset alignments, because there are two more instances of the same pattern pointing to intercardinal directions which do not appear to have any astronomical significance. If the last stone in the west is indeed a flower as imperfect photographs have implied, this would suggest that it does not have a particular alignment. There is no reason for one flower among fourteen to have an astronomical alignment when the other thirteen do not.

Who directed the creation and placement of the embedded stones? The pre-Hispanic symbolism and style of the majority of the stones might indicate that they were a native attempt to preserve their religion in their new sacred space. The connections to the floral festivals and deities enumerated above support this idea. However, there is also the possibility that the Spanish commanded these symbols to be placed there in an attempt to make the new religion more acceptable to the natives. That would explain why the most
detailed stone is the carved Keys of St. Peter: the conquerors would desire to see their own symbolism displayed prominently, though not necessarily to the exclusion of native motifs. If they commanded its placement rather than that of the other stones, this theory could also explain why that is the only stone with an astronomical alignment. Certainly, much more research needs to be carried out in the incredibly rich interdisciplinary field of embedded stones so that my findings may be compared to other, similar churches in Mexico.
Works Cited:


Nuttall Codex.


Vindobonesis Codex.