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THE "COATLICUES" AT THE TEMPLO MAYOR

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Abstract

The colossal "Coatlicue" sculpture has usually been interpreted as a representation of the female supernatural Coatlicue (Serpents Her Skirt) who gave birth to the Mexica patron deity Huitzilopochtli, or it has been identified as the cult figure of Cihuacoatl (Woman Serpent) or Tlaltecuhtli (Earth Lord). This paper offers an alternative reading of the monumental statue, one that recognizes the existence of at least three nearly identical "Coatlicues" and thus recontextualizes the monument as one of a larger set. The iconography of these great stone females points to their identity as Tzitzimime, celestial demons who were understood to descend to devour humankind if the sun were to fail. According to the Mexican chroniclers, a cadre of these fearsome monoliths dominated the sculpture progam of the Templo Mayor.

The colossal "Coatlicue" (Figures 1 and 2), its andesite form rising 2.52 m, is the most profoundly moving work of Aztec sculpture, considered a unique masterpiece with a central essence that is the epitome of the pre-Columbian Aztec aesthetic. So Justino Fernández conceptualized it in his groundbreaking 1954 monograph, *La Coatlicue*. The "Coatlicue" and the Calendar Stone, now joined by the recently unearthed Coyolxauhqui relief, are the best known of all Aztec monuments, but it is the "Coatlicue" that continues to evoke the greatest emotional response. A number of Mesoamericanist scholars, including myself, first became interested in Aztec culture precisely because they saw, were affected by, and ultimately wanted to understand this powerful sculpture.

Although, shortly after its discovery, Antonio León y Gama (1792:37–39) identified the image as Teoyaomique (the personified souls of those warriors who died on the battlefield) and the consort of the solar/war god Huitzilopochtli, the sculpture is usually interpreted as the cult image of the female earth-mother deity. Since the late nineteenth century, the name assigned most prominently to the statue has been "Coatlicue" (Serpents Her Skirt), the mother of Huitzilopochtli (e.g., Chavero 1882:298, 427, 1888:103; Seler 1902–1923:2:788; Fernández 1954; Marquina 1960:112). We remember this maternal Coatlicue as the woman who was impregnated by a ball of eagle down while sweeping in the temple courtyard, according to the legend recorded by Bernardino de Sahagún (1950–1982:3:1–5). Like the colossal statue, Huitzilopochtli's mother is noted for her skirt of intertwined serpents. More recently, other scholars have interpreted the sculpture more broadly as a manifestation of Cihuacoatl, the principal Aztec goddess and the old goddess of the earth, of which Coatlicue is one aspect (Carrera 1979:188; Pasztory 1983:158; Klein 1988:243). In this vein, some scholars have proposed that the statue itself stood within Tlillan, the House of Blackness that was the temple of Cihuacoatl in Tenochtitlan's ritual precinct (Seler 1902–1923:2:794; Alcocer 1935:585–559; Klein 1988:243). Others, leaning away from a Cihuacoatl interpretation, have argued that the colossal statue represents the earth more broadly (Graulich 1991; Baquedano 1993:160–161). Certainly, the "Coatlicue" sculpture manifests aspects of Coatlicue, Cihuacoatl, and Tlaltecuhtli (Earth Lord), but not only these.

My intent is not to refute these interpretations, for I agree largely with the arguments that support them. Rather, I want to contribute to the ongoing process of reading the "Coatlicue" by pointing out some of the sculpture's other associations, by noting how those who saw the giant sculpture described it, and by suggesting how the original stone carving may have been physically placed in the ritual precinct. Principally, I want us to reconceptualize the colossal statue and recognize it not as a single cult image and unique masterpiece but as one example of a larger set of sculptures. The "Coatlicue" is not a singular object or even one of a pair of monuments, and any interpretation of it must take its multiplicity into account. I argue that the colossal stone female was one of a group of several great sculptures (perhaps as many as six) called "Tzitzimime" that were placed around the shrines of the Templo Mayor. Instead of one "Coatlicue" housed in the innermost recess of a dark shrine, there was a cadre of these awesome monoliths dominating the iconographic program of the Templo Mayor.

My approach to re-evaluating the "Coatlicues" follows three tracks. First, I consider the purely visual evidence of the "Coatlicues" and related images to obtain the one iconographic reading that dominates, in my mind, the other potential readings. Second, I turn to the prose sources to understand more deeply how the Mexica conceptualized the supernaturals (Tzitzimime and others) represented by these images. Third, I look to the specific physical placement of the sculptures. This culminates in a contextualized reading of the "Coatlicues" as part of the iconographic program of the Templo Mayor.

The "Coatlicues," like so many Aztec sculptures, lost their physical and social context when they were relocated and broken-up during the Spanish conquest and the aftermath, when Aztec cities were reworked into colonial centers. The few Aztec monuments that have been found fully in situ, such as the great Coyolxauhqui relief, reveal but a part of the rich iconographic program of the

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Figure 1. Front of "Coatlicue" statue (from Brehme 1923:184).



Figure 2. The "Coatlicue" from a three-quarter back view. Photo by Elizabeth H. Boone.

Templo Mayor. By assigning the "Coatlicue" sculptures to their original locations and reinterpreting them in this context, this paper adds to the ongoing efforts to understand the visual message of Tenochtitlan's ritual precinct: how Mexica power and Mexica dominance were expressed in stone.

THE ICONOGRAPHIC ASSEMBLAGE

The Freestanding Statue

The "Coatlicue" depicts a standing female whose hands are raised aggressively but who is decapitated and dismembered. The head and neck have been severed by a cut at the top of the clavicle. From this cut two serpents rise and face each other, so that the profile of each serpent head forms one half of the statue's face. These twin serpent heads visually create fearsome faces on both the front and back. The anthropomorphic body of the "Coatlicue" stands on feet that are the claws of a bird of prey, probably an eagle (Fernández 1954:213). Although the feet have been interpreted as jaguar claws (Seler 1902–1923:2:790), their avian rather than feline character is assured by the single talon at the back. Circular eyes, usually associated with death ("death eyes" [Seler 1963:1:27]), animate the feet. The statue has pendant breasts that identify a mature woman who has already given birth, and the joints (namely the shoulders and elbows) are marked by distinctive fanged faces with other "death eyes." The forearms are held upraised from the elbows, and the "hands" are slightly extended in a grasping or attack position. The hands themselves are replaced with the same kind of serpents that rise at the neck. Two other serpents undulate down beneath the skirt and between the legs, one in the front and one in the back, with their heads facing forward and backward between the statue's feet.

In sculptural representations, these serpents are unique to the "Coatlicue" statues and to the closely related "Coatlicue del Metro," where a serpent appears as a serpent belt (Heyden 1971). They are banded serpents, not unlike the coral snakes associated with many Aztec goddesses, but unlike the coral snakes, they are covered with a loosely woven web (in a plain, not a net, weave) interspersed regularly with jade or turquoise discs (symbols of preciousness). This jeweled web pattern is similar (but not identical) to the webbed

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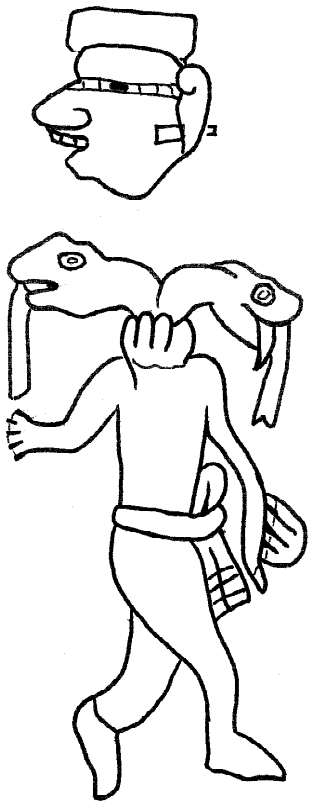


Figure 3. Beheaded male with serpents issuing from his neck (after *Tonalamatl Aubin,* fifteenth trecena). Drawing by Elizabeth H. Boone.

turquoise patterns on the cloaks of Aztec rulers, the dotted-square patterns of skirts worn by Cihuacoatl and some other water/corn/fertility goddesses, and the scaly markings of the *cipactli* (crocodile).[1] On the "Coatlicue," it probably signals the quality of preciousness, as Fernández (1954:214) suggested. The serpents issue, like great streams of blood, from the figure's neck and wrists, just as two serpents rise from the neck of a decapitated man in the Tonalamatl Aubin (Figure 3). It is clear that the "Coatlicue" statue represents a decapitated and partially dismembered female.

Between the shoulders, on the upper back, is the date 12 Reed, a date I interpret as a year because it is framed by a rectangular cartouche. This year is not noted for its cosmological significance, although a passage in the *Anales de Cuauhtitlan* suggests that 12 Reed was the first year of the Second Age or Sun, when the sky collapsed at midday and plunged the world into darkness, whereupon the people were eaten (*Codex Chimalpopoca* 1992:25, 26). The cosmogonic association of the year date accords with my reading of the sculpture, as discussed below. However, we should also recognize that the date may simply indicate the year the sculpture was completed, in this case A.D. 1439 or 1491 (Umberger 1981:77).

[1] For the royal cloaks, see Anawalt (1990, 1993, 1996) and Aguilera (1997); for the dotted-square skirts of the goddess, see the *Codex Magliabechiano* (1970:31r, 45r, 91r), the *Codex Telleriano-Remensis* (8r, 22r), and the *Codex Borgia* (10, 13, 58, 61); Chantico has a dotted-square pattern painted on her face (*Codex Telleriano-Remensis* 21v; *Codex Borgia* 57, 62). For the *cipactli*, see the *Codex Borgia* (21, 56).

If the 12 Reed is a day rather than a year, it falls in the eighteenth trecena, governed by the goddess Chantico.

The female wears a distinctive costume made of six separate components: a skirt, a belt, a back apron, a necklace, wrist bands, and leg bands.

- Skirt: Below the bare chest, she wears a skirt of intertwined rattlesnakes (forming a net of serpents).
- Belt: Encircling her waist is a double-headed serpent belt, tied in the front, with the two heads hanging down in front. This serpent is the same type that springs from the neck and wrists.
- Back apron: In the back, the belt secures a human skull, from which depends a back apron. This back apron has two hanging tiers of braided leather cords, with long sliced shells attached at the bottom. Sahagún (1950–1982:3:16) called such a skirt or overskirt a *citlalcueitl* (star skirt) (Seler 1902–1923:2:790; Nicholson 1967:86), although it does not otherwise carry diagnostic star imagery. Each tier is also decorated with a pair of large feathers (probably eagle feathers) held by a circular gathering of feather down.
- Necklace: The figure wears a necklace composed of alternating hearts and human hands, with a pendent skull hanging in front. The cord of this necklace, which is tied in a knot at the back, is identified as a rope of blood by the slightly wavy lines and the circular discs on its surface.
- Wrist bands: Around the wrists are fringed wrist bands from which hang paper streamers.
- Leg bands: Around the shins are leg bands composed of a row of plain discs, a row of feathers, and a row of copper bells hanging down, with longer feathered panels attached to the sides.

The Underside Relief

Carved in low relief on the underside of the monolith is a frontal, crouching figure (Figure 4). Although Fernández (1966) related the figure to Mictlantecuhtli (Lord of Mictlan, the death god), Nich-



Figure 4. The underside of the "Coatlicue" showing the relief of the Tlalocoid–Tlaltecuhtli (from Solís 1991:134).

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olson (1967:87) has more persuasively identified the image as a Tlalocoid–Tlaltecuhtli, a male manifestation of the earth lord as the rain god, or the rain aspect of the earth lord. Such images and other versions of Tlaltecuhtli were often carved on the underside of large or important sculptures. The figure is in a standard earth-lord crouch, although presented frontally in Figure 4, with a *chalchihuitl* (jade) element covering the torso, and it has such Tlaltecuhtli features as clawed hands, which grasp skulls, and skulls tied loosely with cords to the arms and legs. The day/year date, 1 Rabbit, above the headdress carries multiple, layered references to the earth, because 1 Rabbit is at once the day name of Tlaltecuhtli (Caso 1959:86; Nicholson 1967:85; Ruiz de Alarcón 1984:128, 220), the year the earth was created (*Codex Chimalpopoca* 1992:25), and the specific year, in A.D. 1454, of the great famine that devastated highland Central Mexico. The figure's fanged mouth, heavy brow ridge, and round earspools associate it with Tlaloc.

THE SET OF "COATLICUES"

Since its discovery in 1790, at the southeast corner of the Zócalo (Mateos Higuera 1979:228–229), and its publication in 1792, the "Coatlicue" has been considered by scholars and the general public alike as a unique masterpiece. This singularity held true until 1933, when a badly battered monolith, now called the "Yolotlicue" (Figure 5), was unearthed at the corner of Seminario and Guatemala, near the west facade of the Templo Mayor (Marquina 1960:19, 115; Gurría Lacroix 1978:31). The "Yolotlicue" is identical to the "Coatlicue" in every respect except that it has a skirt not of intertwined rattlesnakes but of hearts. Although the upper part of the "Yolotlicue" is largely destroyed, enough detail remains to show that it, too, had hands and a head formed by the same massive serpents. It was assigned the descriptive name "Yolotlicue" (Hearts Her Skirt) because it is a female figure with a skirt of hearts.[2]



Figure 5. The "Yolotlicue." Photo by Elizabeth H. Boone.

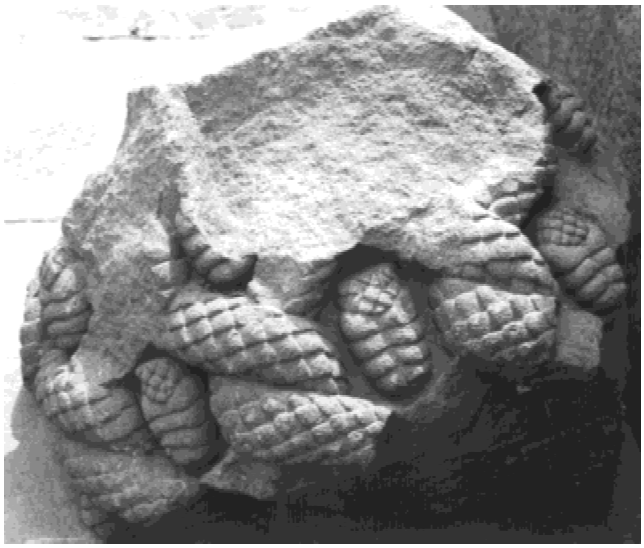


Figure 6. Fragment of the serpent skirt of another "Coatlicue." Photo by Elizabeth H. Boone.

The existence of the "Yolotlicue" compelled scholars to recognize that the "Coatlicue" was one of a pair of great monuments. Jorge Gurría Lacroix (1978) proposed that the sculptures stood as a pair of monoliths on either side of Huitzilopochtli's cult image at the Templo Mayor. Others admitted that a second variant existed but have continued to conceptualize the "Coatlicue" in the singular (e.g., Fernández 1954; Graulich 1991).

The "Coatlicue" and "Yolotlicue" are more than a pair, however; the Museo Nacional de Antropología houses three other "Coatlicue" fragments. One is a piece of the skirt of intertwined serpents, which measures .97 m (Figure 6). The other is a fragment that includes the sculpture's leg and distinctive leg bands below the edge of the serpent skirt and beside the back apron, measuring 1.03 m (Figure 7).[3] A third fragment is part of an arm with a fanged face on the elbow (Pasztory 1983:158). Their carving style is sufficiently similar to indicate they are roughly contemporary with each other and with the two, more complete sculptures. These three fragments either come from the same co-

[2] The name "Yolotlicue" does not appear in the sixteenth-century sources.

[3] In 1973 the fragment of the serpent skirt (MNA no. 11-3386) was located in the lower courtyard below the director's office, and the leg fragment (no visible MNA number) was in the upper garden behind the director's office (both have since been moved to the bodega). They are illustrated together (with measurements) in Mateos Higuera (1979:263, 264, 266 [nos. 24-203 and 24-212]). Katz (1945:135) may have been the first to point out the existence of "Coatlicue" fragments, which he said he saw in the courtyard of the Museo de Antropología when it was located at Calle Moneda 13.

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Figure 7. Fragment of the leg, skirt, and back apron of another "Coatlicue." Photo by Elizabeth H. Boone.

lossal female (a third in the group) or from two or three individual sculptures.[4] One or more Tlalocoid–Tlaltecuhtli relief fragments may also represent the last remains of still other colossal "Coatlicues," for they recall the Tlaltecuhtli images carved on the undersides of the "Coatlicue" and "Yolotlicue" (e.g., Mateos Higuera 1979:260, 266 [no. 24-27]).

Although it is difficult to say how many originals are represented by these actual and possible fragments, we know with certainty that there were at least three "Coatlicue"-like sculptures: two with serpent skirts and one with a heart skirt.

RELATED IMAGES

Aztec figural art is supremely multivalent. As Alfredo López Austin (1983) pointed out, Aztec deities and sacralities glide between precise meanings and firm identifications with the grace of quicksilver, so that a supernatural force that is manifest as a sacred image can be at one time the earth, at another time the sky, and at another time the underworld, the single figure embracing all, yet not remaining solely with one. Justino Fernández (1954) was correct when he characterized the monumental "Coatlicue" sculpture as the quintessence of the Aztec aesthetic, for these colossal statues are profound exemplars of this ideological and artistic phenomenon. The "Coatlicue" is a sculpture that has defied efforts to compartmentalize it and define it within precise parameters. One of its great features is the multiplicity of meanings and associations that it embraces and brings together.

Most of the physical features and costume elements of the colossal "Coatlicues" are not specific to these sculptures (only the combination is specific to them). Rather, as individual features and elements, they are the attributes of a broad range of supernaturals, including Tlaltecuhtli (Earth Lord), Mictlantecuhtli (Mictlan or Death Lord), and the cluster of fertility/death females that includes Coatlicue (Serpents Her Skirt), Cihuacoatl (Woman Serpent), the Cihuapipiltin (Princesses) or Cihuateteo (Goddesses), Itzpapalotl (Obsidian Butterfly), and the Tzitzimime (Demons).

Tlaltecuhtli

The most obvious sharing of attributes is with images of Tlaltecuhtli, the sexually ambivalent lord of the earth, whose form was often carved in low relief on the undersides of important sculptures (Figures 8 and 9). Tlaltecuhtli reliefs appear on the undersides of several cult images and coiled feathered serpents, as well as many pieces of temple furniture such as *cuauhxicalli* ("eagle vessels" for holding hearts and blood), boxes (i.e., the Hackmack box), and cubes or small altars (i.e., Stone of Death Monsters/Altar of Death) (e.g., Nicholson and Keber 1983:37, 54, 66). H. B. Nicholson (1955, 1967, 1972) securely identified these crouching, icon-laden figures as Tlaltecuhtli (Earth Lord), and he distinguished three types: a variety with "gaping teeth-studded jaws facing upward" (Figure 8), a human-headed variety with the head thrown back (Figure 9), and a "Tlalocoid" variety characterized by the fanged mouth of the Rain God (Figure 3).[5] The first two varieties are always presented in back view, with the head thrown back as if it were wholly or partly severed at the neck (Klein 1988:243, 1994:231). These are the varieties that share the most features with the "Coatlicues." Like the giant "Coatlicues," they have eyed claws instead of hands and feet, and they have fanged faces marking their joints. A serpent belt often secures a skull to the back, below which usually hangs the back apron ("star skirt") of braided leather strips with sliced shells. In addition, these Tlaltecuhtli figures usually wear the same leg bands and occasionally the same wrist bands as do the "Coatlicues." Doris Heyden (1971) identified the "Coatlicue del Metro," discovered in the Metro excavations of 1967, as a three-dimensional version of Tlaltecuhtli,

[4] The serpent rattles in the middle of the skirt (Figure 6) have four units, whereas the rattle along the skirt's edge (Figure 7) has five units, a relation that is similar to that of the "Coatlicue," where the middle rattles have three units and the hem rattles have four units. Thus, the two fragments have more units per rattle than does the "Coatlicue," which favors the suggestion that they belong to the same ancient sculpture.

[5] See also Baquedano (1993), Gutiérrez Solana (1990), Klein (1988: 242–245), and Matos Moctezuma (1997); Klein interpreted the second variety (Figure 9) as a manifestation of Cihuacoatl.

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Figure 8. Tlaltecuhtli relief (underside of Hackmack box; from Seler 1902–1923:2:735).

because it shares so many of these same iconographic elements (Figure 10). The "Coatlicue del Metro" also features a webbed serpent belt and a necklace of alternating hearts and hands (but without the pendant skull).[6]

Unlike the "Coatlicues," however, the Tlaltecuhtli reliefs and the painted images of the earth lord in the codices are almost always pictured crouching. They usually have tousled hair, have skulls tied to their limbs, and wear skirts of skulls and crossed bones; none wears a serpent skirt or a heart skirt. Their back aprons, moreover, lack the two large eagle feathers and, instead, often have jaguar pelt markings that tie them more closely with the earth.

Mictlantecuhtli

Mictlantecuhtli images, especially as these are painted in the *Codex Magliabechiano* and *Codex Tudela*, share many of the iconographic features of the Tlaltecuhtli reliefs. They, too, have claws (usually eyed claws) for hands and feet and can have fanged faces at the joints. Their skulls are topped by tousled hair punctuated by the rectangular banners that symbolize sacrifice. One image in the *Codex Magliabechiano* (Figure 11) features a serpent belt, but without the attached skull or back apron.

Fierce Women Supernaturals

The same general cluster of iconographic elements also characterizes the group of fearsome, creator/destroyer women that includes the old goddesses Coatlicue and Cihuacoatl, the Cihuapipiltin or Cihuateteo (spirits of women who died in childbirth), the warrior goddess Itzpapalotl, and the monstrous Tzitzimime. Painted and sculpted images of these women usually have fleshless jaws and the round "death" eyes of skulls; they usually also have tousled hair often punctuated with the paper banners that symbolize sacrifice. Like the "Coatlicues," the Tlaltecuhtli reliefs, and the painted Mictlantecuhtli images, the fierce women supernaturals often have claws instead of hands, and they can have eyed claws on their joints.

These physical features and costume elements form an iconographic package that characterizes a broad range of supernaturals related to the earth, the underworld, or death. The package includes fleshless jaws and skulls, open mouths with teeth bared, tousled hair with or without sacrificial banners, fanged faces at the joints, claws for hands and feet, and distinctive wrist and leg bands. Appearing individually or as a cluster, the elements do not themselves specify the identity of an individual supernatural; rather, they describe and qualify a number of supernaturals who overlap



Figure 9. Tlaltecuhtli relief (from Chavero 1888:750).

[6] The serpent heads that peer outward beneath each knee may be the two heads of the double-headed belt.

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Figure 10. The "Coatlicue del Metro" (from Heyden 1971:154).



Figure 11. Mictlantecuhtli, from *Codex Magliabechiano* 79r (1970).

ideologically. Therefore, the presence of some of these iconographic features on the "Coatlicues" and on the Tlaltecuhtli reliefs does not mean that the colossal statues are manifestations of the earth; rather, their presence indicates that the "Coatlicues" and the Tlaltecuhtli reliefs, like Mictlantecuhtli and the group of fierce women, share some of the same ideological characteristics.

SHARED ICONOGRAPHY AND FEMALE CHARACTERISTICS

The identity of the colossal "Coatlicue," I feel, lies not with the Tlaltecuhtli reliefs but with the female supernaturals. The "Coatlicue" is blatantly female, with her bare chest and skirt, and the collapsed, pendent condition of her breasts shows her to be a mature, perhaps old, woman. Like the Coyolxauhqui relief, the "Coatlicue" statue presents a beheaded and dismembered female, a state that allies her with other conquered or killed women (Klein 1994:241–243). Great serpents spring from her wounds to replace visually her head and hands.

The colossal "Coatlicues" share specific iconographic features with the female supernaturals. Painted representations of Cihuacoatl (Serpent Woman) present the old fertility goddess with either a fleshless jaw or a skull, tousled hair, wrist bands with hanging paper streamers, and a skirt much like the back apron of the "Coatlicue" and the Tlaltecuhtli reliefs (Figure 12) (*Codex Borbonicus* 23,



Figure 12. Cihuacoatl, *Codex Borbonicus* 23 (from Seler 1963:1:216).

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Figure 13. Sculpture of one of the Cihuapipiltin. Photo by Elizabeth H. Boone.



Figure 14. Coatlicue, the mother of Huitzilopochtli (from Sahagún 1979:3: Folio 3r).

Codex Magliabechiano 45r).[7] Sahagún (1950–1982:3:16) mentioned this "star skirt" as part of the array of Teteo innan (Mother of the Gods), also called Toci (Our Grandmother; Nicholson 1967:86). The related, but minor, goddesses Yxcuina and Chantico wear the same braided leather and shell garment as either a skirt or a back apron. Chantico also wears the distinctive wrist and leg bands of the "Coatlicue" (*Codex Telleriano-Remensis* 17v, 21v; *Tonalamatl Aubin* 18); in the *Tonalamatl Aubin* (18), she has a banded serpent issuing out from beneath her throne.

Sculpted images of the Cihuapipiltin (Princesses), the souls of women who have died in childbirth, likewise wear this "star skirt" that ends in sea-snail shells—like the Cihuacoatl, they wear it as a skirt rather than a back device—and they have skeletal faces (Figure 13).[8] Although Cihuapipiltin sculptures usually are kneeling, like the "Coatlicue" they are usually bare breasted and have outstretched clawed hands that seem ready to attack. One finely carved example wears a crown of skulls, a necklace strung with a skull and severed hands, and wrist bands with paper streamers (Figure 13).

The old goddess Coatlicue (Serpents Her Skirt) assumes a similar pose and aspect when she is shown giving birth to Huitzilopochtli (Figure 14). At Coatepec, Coatlicue kneels while the serpents of her skirt writhe about her thighs. Although her face is fleshed in this European-style illustration, she still has the wide mouth, tousled hair, and grasping, outstretched hands of the Cihuapipiltin; she also wears down balls (symbols of sacrifice) in her hair. The "Coatlicue" statue from Coxcatlan in Puebla (Figure 15) is a standing manifestation of this being. Bare-breasted and wearing a skirt of intertwined serpents and a serpent belt, the Coxcatlan "Coatlicue" stands with hands outstretched. Her skeletal face features a wide toothy grimace; strands of curling, tousled hair may once have been attached to the series of holes along the hairline. On her hands and feet, she wears mittens and boots that are the paws of a feline.[9] Seler (1902–1923:2:790) saw this statue as an interpretive key to the colossal "Coatlicue" because of their similarities in posture, gesture, and costume.

Iconographic correspondences with the "Coatlicues" are also found with the warrior goddess Itzpapalotl (Obsidian Butterfly),

[7] Durán (1971:210, Plate 20) described and pictured Cihuacoatl as having "a huge, open mouth and ferocious teeth. The hair on her head was long and bulky. "

[8] Several of these sculptures are specifically identified as Cihuapipiltin by having one of five day signs (the days when they descend to earth) carved on the tops of their heads.

[9] The day date 8 Cipactli (Crocodile) is carved on the back of her head, where it would have been covered by hair that was attached; its meaning is not understood (see Pasztory 1983:214).

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Figure 15. The "Coatlicue" from Coxcatlan, Puebla (from Seler 1902–1923:2:789).



Figure 16. Itzpapalotl, patron of trecena 15, from the *Codex Telleriano–Remensis* 18v (1995).

who is pictured as the principal patron of the fifteenth trecena in the *tonalpohualli* (Figure 16). Itzpapalotl has the skeletal face and outwardly grasping claws associated with the other fierce women. She also has eagle feet, wears the distinctive wrist bands and leg bands of the "Coatlicues," and has the distinctive back apron, topped by a skull. In addition, she wears in her headdress the panache of two large eagle feathers that embellishes the back apron of the "Coatlicue." The particular feather panache is often a feature of the headdresses of warriors, for example, the eagle and jaguar warriors pictured in *Codex Borbonicus* trecena 13 and carved on the Malinalco drum, as well as some of the men on the Stone of the Warriors.

An image of Itzpapalotl carved in relief on the top of a low broad box (Figure 17; Heyden 1974) has the same features as the *Codex Borbonicus* Itzpapalotl. Its wings, however, are clearly those of a butterfly. They are decorated with a loose web pattern studded with discs, the same pattern that distinguishes the serpents of the "Coatlicue."

Iconographically, the varied features of these females come together in the image of Tzitzimime (demons who threatened to descend from the heavens to devour humankind). As pictured in both



Figure 17. Relief carving of Itzpapalotl. Photo by Elizabeth H. Boone.

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Figure 18. Tzitzimitl, from the *Codex Magliabechiano* 76r (1970).

the *Codex Magliabechiano* (Figure 18) and the *Codex Tudela* (46r), the Tzitzimitl has the skeletal face, fierce grimace, tousled hair decorated with sacrificial banners, eyed claws for hands and feet, and fanged faces at the joints, all of which are shared to different degrees by the other supernatural females. In addition, the *Codex Magliabechiano* and *Codex Tudela* Tzitzimime wear the "star skirt" and have a necklace of human hands and hearts. The *Codex Magliabechiano* image is pictured with a serpent extending down between its legs. Of all the images of identifiable supernaturals in the Aztec corpus, it is the Tzitzimitl that shares the most features with the monumental "Coatlicue" sculptures.

THE TZITZIMIME

Tzitzimime are celestial monsters. Alonso de Molina (1970:153, second pagination) translated Tzitzimitl as *nombre de demonio*, and other sixteenth-century chroniclers similarly characterized the Tzitzimime as monstrous, demonic beings. Cristóbal del Castillo (1991:150–151) called the Tzitzimime *grandes fieras*; Chimalpahin (1889:139) referred to them as *tecuanime, tzitzimime* (fierce beasts, *tzitzimime*). The Spanish friars, searching among the Aztec supernaturals for diabolical equivalents, seemed to have settled on the Tzitzimime as a close equivalent to their understanding of Satan and other "devilish" forces. Indeed, as Klein (2000) argued, the chroniclers emphasized the bellicose aspects of the Tzitzimime and the group of female supernaturals that includes Coatlicue, Cihuacoatl, Cihuapipiltin, and Itzpapalotl. In this vein, Sahagún (1950–1982:1:64, 70) used *tzitzimitl* interchangeably as demon or devil: *diablome, tzitzitzimi, culelti* (devils, demons, evil spirits). The annotator of the *Codex Magliabechiano* (75v) translated Tzitzimitl as *una saeta*, perhaps because, like darts, these creatures descend from the sky to cause harm, or simply because *mitl* means arrow or dart.

The Dominican lay brother Pedro de los Ríos characterized the Tzitzimime from a Christian perspective as celestial beings, specifically stars, who had sinned and were expelled from or fell from grace. In the *Codex Telleriano-Remensis* (4v), he annotated the illustration of the monthly feast of Quecholli, dedicated to Mixcoatl, by noting:[10]

> The feast of the descent of Mictlantecuhtli and of Zontemoc and the others; and thus they depict him [Mixcoatl] with the accoutrements of war because he brought it [war] into the world.
>
> Properly it should be called the fall of the demons, who they say were stars; and thus there are now stars in the sky that they call [by the] names they had, which are the following: (Yacatecuhtli, Tlahuizcalpantecuhtli, Ce Acatl Quetzalcoatl, Achitometl, Xacopancalqui, Mixcoatl, Tezcatlipoca, Zontemoc)[11] like god. They call them this name before they fell from heaven, and now they call them Tzitzimitl, which means monstrous or frightening thing [Quiñones Keber 1995:255].

In the *Codex Ríos*, Father de los Ríos, with his Catholic perspective evident, specifically associated the Tzitzimime with Mictlantecuhtli, whom he characterized not as a neutral lord of the underworld but as god of Hell. According to the *Codex Ríos*:

> In that place of Hell they believed that there were four gods, or principal demons, also one which was superior, which was called Zitzimitl, that is Miquitlamtecotl, the great lord of hell. Yzpuzteque, the lame devil, that appears at the roads with feet of a rooster. Nestepehua, the spreader of ashes. Contenoque, the same as that which descends with the head lowered, alluding to the etymology that scholars give to the devil, in other words, falling, the motion they attribute to the similar lowering of the souls. This name and the second, which is Yzpuzteque, is one who appears in the streets, and is the same as Satan. . . . It is said that these four gods, or demons, had women; likewise they say that they obtained these [women] from the sky, each one his own, although not as a wife but as a companion [*Codex Ríos* 1900:3r; author's translation from the Italian].

The gods and their female counterparts are pictured on the facing page (Figure 19): Mictlantecuhtli, at the top, is glossed "Miquitlan.tecotle, which is to say, Lord of the Inferno. Tzitzimitl, the same as Lucifer." Then follow, in descending order, the pairs of "Yxpuzteque," "Nextepeua," and "Contemoque" (Zontemoc). The males and females all have fierce grimacing facial expressions, outstretched grasping hands (not unlike claws), and

[10] Quiñones Keber (1992:126) identified Pedro de los Ríos as the "third" annotator of the *Codex Telleriano-Remensis*.

[11] The names in parentheses were themselves added by another annotator (Quiñones Keber 1995:265).

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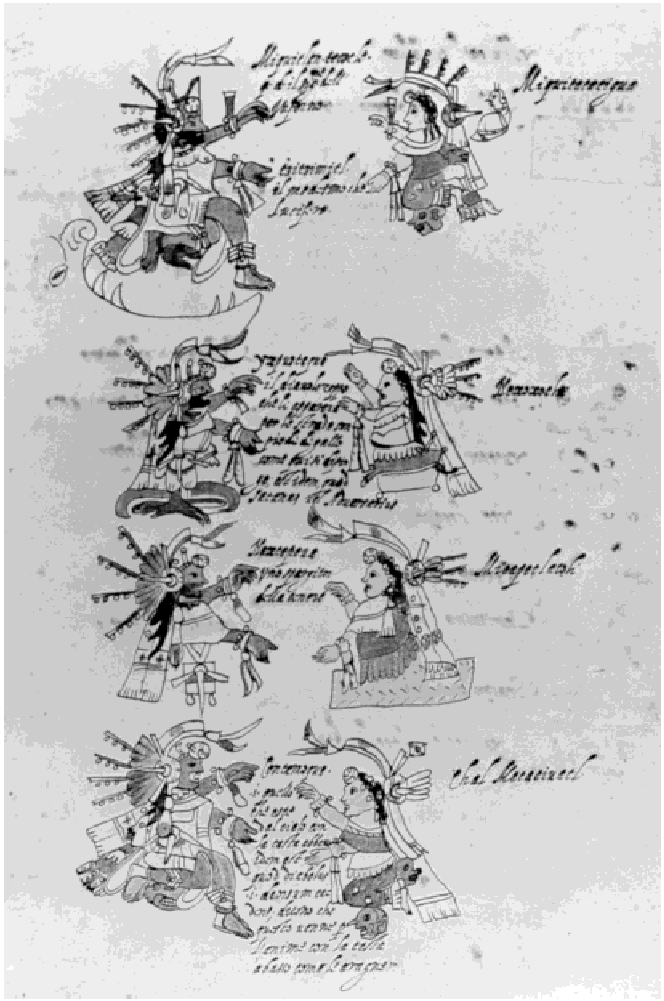


Figure 19. Tzitzimime, from the *Codex Ríos (Codex Vaticanus A)* 2v (1979).

wrist bands with paper streamers; the women have tousled hair. Sharing the generalized Tzitzimitl iconography, the Mictlantecuhtli and Zontemoc pairs also wear the braided back apron topped by a skull.

The *Historia de los mexicanos por sus pinturas* (Garibay 1979:69) locates the Tzitzimime in the second level of the heavens. The text describes them as fleshless, skeletal women who "are called tezauhcihuah and by the other name tzitzime," who would devour humankind at the time the world comes to an end.

Thompson (1934:231) described the Tzitzimime as "stars, constellations or planets in the heavens, who were considered under certain circumstances to be baneful." In this he was following the above descriptions in the *Codex Telleriano-Remensis* and *Codex Ríos* and those of the Nahua historian Fernando Alvarado Tezozomc, who described the Tzitzimime as "angels of the air and sustainers of the sky," as planets, and as "gods of the air" (1878:358, 486, 451). But the Tzitzimime were clearly malevolent beings. They would appear and descend on occasions like eclipses when the sky darkened (when stars would be visible), and they were said to devour humankind (Seler 1963:1:139). Sahagún (1950–1982:7:2) warned that "If the eclipse of the sun is complete, it will be dark forever! The demons of darkness [*tzitzitzimi*] will come down; they will eat men!" Chimalpahin (1889:139) recorded the appearance of Tzitzimime during a total or near-total eclipse in the year 12 Rabbit (A.D. 1478), and the *Codex Aubin* (1893:77) recorded their appearance in 13 House (A.D. 1505); the *Codex Aubin* annalist painted the Tzitzimitl as the frontal face of a horned, hairy monster, like a European imp.[12] Sahagún (1950–1982:8:2) did not mention a specific year but noted that, during a mid-day eclipse of the sun in the reign of Ahuitzotl, the people feared that the Tzitzimime would descend to devour them.

Tzitzimime also imperiled the world at the time of the New Fire Ceremony. Once all the fires had been extinguished and darkness had set, the people were filled with dread that the demons might come. Sahagún (1950–1982:7:27) wrote how "it was claimed that if fire could not be drawn, then [the sun] would be destroyed forever; all would be ended; there would evermore be night; Nevermore would the sun come forth. Night would prevail forever, and the demons of darkness [*tzitzitzimi*] would descend, to eat men." Pregnant women donned masks and were hidden in granaries for fear, if the new fire were not drawn, that they themselves would be changed into these human-eating beasts (Sahagún 1950–1982:7:27).

On specific occasions, the Tzitzimime would descend on a particular mission. As Klein (1994:232–233, 2000) and Quiñones Keber (1995:174) pointed out, the *Histoyre du Mechique* (Garibay 1979:107) preserves the legend of how the virgin goddess Mayahuel was abducted by the wind god Ehecatl. Mayahuel's grandmother, who is described as an old goddess named Tzitzimitl, then gathered all the other goddesses who were called Tzitzimime; together they descended to earth to find Mayahuel, whereupon they tore her apart. Mayahuel's bones were then collected and buried, and from these bones sprouted the maguey plant.

Tzitzimime blended with the Cihuapipiltin (Princesses) or Cihuateteo (Goddesses), the manifest souls of women who had died in childbirth, who, like the Tzitzimime, could descend from the heavens to afflict humankind (Seler 1902–1923:2:840–841). Having fought and lost the brave battle to bring a child into the world, the Cihuapipiltin are the functional equivalent of the souls of the warriors who died on the battlefield or on the sacrificial stone (Seler 1963:1:24–25; Nicholson and Keber 1983:67–68). They accompany the sun from its zenith to its setting in the west, after which, as Sahagún (1950–1982:6:163) explained, they would descend from the heavens to look for spindles, weaving sticks, and reed baskets, the equipment of women. Sahagún noted that "the demon, the devil [*in tzitzimitl*, *in coleletli*], deceived in this manner," appearing like a Mocihuaquetzqui (a woman who has died with a child still in her womb; Sullivan 1966:90–91). The deified women "hate people" and "mock them"; they dwell at the crossroads ready to attack humans who might appear there, particularly children (Sahagún 1950–1982:1:19). On five days (1 Deer, 1 Rain, 1 Monkey, 1 House, 1 Eagle), the Cihuapipiltin were said to come down to earth to harm boys and girls, afflicting them with palsy, physical deformities, and other ailments (Sahagún 1950–1982:4:10, 41, 81, 93, 107; Seler 1992:3:154; Nicholson and Keber 1983:68). So dreaded were the descending Cihuapipiltin that parents kept their children inside and away from the doorways on those days (Sahagún 1950–1982:4:81).

The Tzitzimime merged also with the goddess Cihuacoatl (Snake Woman), whom Sahagún (1950–1982:1:11) described as

[12] The *Codex Aubin* (1893:72) also noted the eclipse in 12 Rabbit (A.D. 1478) but did not mention Tzitzimime.

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"a savage beast and an evil omen. . . . By night she walked weeping, wailing; also was she an omen of war." Moreover, Cihuacoatl was a female warrior, whose shield and costume were adorned with eagle feathers. The Song of Cihuacoatl calls her "The eagle, The eagle Quilaztli, . . . Our mother, War woman" (Sahagún 1950–1982:6:236). As Seler (1902–1923:2:1054) noted, Torquemada (1975:1:117) included among Cihuacoatl's names Quilaztli, Quauhcihuatl (Eagle Woman), Yaocihuatl (Warrior Woman), and Tzitzimicihuatl (which he translated as Infernal Woman). Durán (1971:210, 217) remarked that more men were slain in honor of Cihuacoatl than for any other, because she was always famished; he described her stone image with tousled hair and a huge open mouth with ferocious teeth. In the more secular realm, *cihuacoatl* was also the title of a high political office, second in rank only to the *huetlatoani* (great king; Klein 1988).

Itzpapalotl, like the supernatural Cihuacoatl, is both a warrior and a mother goddess; like the Cihuapipiltin, she is both a warrior and a celestial being (Heyden 1974). Itzpapalotl is also a Tzitzimitl. In the *Codex Telleriano-Remensis* (18v), Pedro de los Ríos described her within the metaphor of the Garden of Eden, saying she was like "Eve after she sinned"; describing her as a child of Citlalicue (Stars Her Skirt) and Citlalatonac (Glowing Star), he saw her as one of the supernaturals (like the Tzitzimime) who existed in the paradise of Tamoanchan but, because they had sinned, fell from heaven. The (fifteenth) trecena she governs begins with the day 1 House, when the Cihuapipiltin descended.

Seler (1963:1:137) described Itzpapalotl as an ancient Chichimec earth goddess, the first sacrificial victim, and the first to die in war. She is mentioned at the very beginning of the *Anales de Cuauhtitlan*, before the year count is established and before the five ages had begun, as a supernatural who speaks to and advises the Chichimecs (Klein 2000). The *Anales*, the *Leyenda de los Soles* (*Codex Chimalpopoca* 1992:23, 27, 152, 212), and Muñoz Camargo's *Historia de Tlaxcala* (1947:52) all include parts of a legend about Itzpapalotl. Although the details differ from manuscript to manuscript, this ancient goddess is said to have eaten the 400 Mixcoa, after which she herself was impaled on a barrel cactus, killed with arrows, and burned by the Mixcoa men named either Mixcoatl or Xiuhnel and Mimich. The *Leyenda de los Soles* and the *Historia de Tlaxcala* relate that this happened soon after the Chichimecs left Chicomoztoc. The Song of Teteo Innan, recorded by Sahagún (1950–1982:2:226), also speaks of Itzpapalotl and this ancient story, mentioning "the goddess on the barrel cactus, [who] Is our mother, The obsidian butterfly [Itzpapalotl]," who is sought by Mimich "there on the desert plain."

The name "Itzpapalotl" resonates associations of war and sacrifice, for warriors were trained to welcome death by the obsidian blade or knife, which would transform them into celestial hummingbirds and butterflies. Sahagún (1950–1982:6:14) recorded a prayer used to seek aid in war, whereby the warrior was encouraged to "savor the fragrance, the sweetness of death by the obsidian knife. With his heart may he gladden Necoc tene, the ritual feathering, [the goddess] Itzpapalotl. May he long for the flowery death by the obsidian knife." One of the back devices worn by Mexica warriors in battle was called *ytzpapalotl*; it was fashioned like a great obsidian butterfly (Sahagún 1993: RAH ms 87v).

Along with these other fierce women, the Tzitzimime were conceptualized as warriors. Tzitzimitl warrior costumes appear throughout the tribute sections of the *Matricula de Tributos* and *Codex Mendoza* (Figure 20), where they are included as items paid to Moctezuma[13]; a warrior's helmet fashioned like the head of a Tzitzimitl is pictured in Sahagún's *Primeros Memoriales* (1993:RAH 73v; Anawalt in *Codex Mendoza* 1992:1:116, Appendix F). They have the skeletal head and tousled hair associated with earth, death, and star beings. The full-body costumes in the *Matricula* and *Codex Mendoza* feature a horizontal slit in the chest, out of which hangs a stylized liver (the exposed liver characterizes the Tzitzimitl in the *Codices Magliabechiano* [Figure 18] *Tudela*).



Figure 20. Tzitzimitl warrior costume, from the *Codex Mendoza* 23r (1992:4:51).

Thus, the Tzitzimime ideologically embrace the parts of the realms and some of the attributes of the death gods (Mictlantecuhtli), the earth gods and goddesses (Tlaltecuhtli and the Cihuacoatl manifestations), and such other fierce and potentially harmful women as the Cihuapipiltin and Itzpapalotl. Tzitzimime are already-dead warriors, occasionally pictured with their livers hanging out from a slit in their chests or drooping below their exposed ribs. They are earth beings who are associated with and who blend with Cihuacoatl, Teteo inan, and other old goddesses of the earth. They are also celestial beings, especially related to the darkened sky, where they appear like stars when the sun is absent. They embody the threat of the destroyed cosmos, for they are the ones who devoured humankind in an earlier age and who will do so again when the sun of the Fifth Age fails. As such, they are also relics of an earlier age, old supernaturals who were powerful even before the present age began. Klein (2000) argued that these supernaturals could be benevolent as well as malevolent by functioning as creator goddesses as well as destroyers.

Tzitzimime are also beings that come in multiples. Except for the image painted in the *Codex Magliabechiano* and the *Codex Tudela* as an exemplar, the Tzitzimime are consistently mentioned in the plural, which means that they were fundamentally conceptualized this way. Like the monumental "Coatlicue" statues, there was never just one.

[13] They are glossed as Tzitzimime costumes in the *Matricula* (3v, 4r).

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TZITZIMIME AT THE TEMPLO MAYOR

Important, and presumably large, sculptures of Tzitzimime were placed around the Templo Mayor. The Nahua historian Fernando Alvarado Tezozomoc and the Dominican priest Diego Durán, who were following the lost *Crónica X*, are our principal sources for this, and Andrés de Tapia contributes collaborative evidence. In *Crónica mexicana*, Alvarado Tezozomoc discussed several programs to renovate the Templo Mayor, notably those of Moctezuma Ilhuicamina, Tizoc, and Ahuitzotl. The carving and finishing of Tzitzimime statues were apparently a significant part of each effort. In describing Moctezuma's renovation of the Templo Mayor, the chronicler relates:

> As they were finishing a god of stone, which was called Tzitzimimec, Ilhuicatzitziquique, angles of air, sustainers of the sky . . .; with this it [the temple] was finished, where[upon] they had a solemn arietta and general dance in the great plaza of the pyramid of Huitzilopochtli [Alvarado Tezozomoc 1878:358].

This sculpture was only one of a set, however, for Alvarado Tezozomoc mentioned others. At this time, the capital city was awash in war prisoners brought back from successful campaigns in Oaxaca and the Coixtlahuaca Valley. Moctezuma desired a great sacrifice of these men to Huitzilopochtli, but his *cihuacoatl* (chief counselor) Tlacaelel responded:

> Sir, how can you do that? The bodies of the keepers and sustainers of the sky, that are six, are not completely carved, nor their altars and bases [*sentaderos*], that each day 100 stonecutters *tezozonques* go to carve; and it will dishonor us, that to this sacrifice all the lords of the towns have to come, and this is a great court and head of the world; let us abandon it until after all is completed, and until the *xiuhtecatl* [turquoise mirror of Huitzilopochtli] is finished. And with this agreement he ceased the sacrifice [Alvarado Tezozomoc 1878:361].

The slow pace of the renovation and the delay in the sacrifice apparently bothered Moctezuma, for Alvarado Tezozomoc (1878:362) recorded that Tlacaelel then assured his monarch that he would personally oversee and hurry along the work of "the masons and stonecutters who are working to finish the great temple-pyramid, its hearth and bases of the other gods keepers and sustainers of the sky."

Diego Durán, in his *Historia*, mentioned what must be the same statues when he described Moctezuma's renovation. He did not number them, but he added the detail that those called *ilhuicatzitzquique* were so numerous and were placed in such a way that they seemed to support the entire room.[14]

Great statues of Tzitzimime were also part of Tizoc's renovation of the Templo Mayor. Alvarado Tezozomoc (1878:451) explained that:

> And then he [Tizoc] ordered that the great temple of the idol Huitzilopochtli should be given a coat of lime and he ordered the stonecutters next to finish working on the figures of their saints that were called *Tzitzimime*, that were, as they used to say, gods of the air that bring the rains, waters, thunderclaps, lightning and lightening bolts, and they had to be placed around *Huitzilopochtli*.

A new sacrificial stone also was added at this time.

Tizoc's successor, Ahuitzotl, takes credit for the last major, and probably the greatest, renovation of the Templo Mayor, which was completed in the year 8 Reed, A.D. 1487. Alvarado Tezozomoc wrote how, when the rebuilding was completed, Ahuitzotl's *cihuacoatl* ordered the new sculptures (and presumably any being reused) raised up to the temple.

> He summoned the ambassadors to go to Acolhuacan and Tlalhuacpan, Tacuba and the other neighboring towns, to bid the Indians to come and raise up to the high temple the gods, signs and planets, that they called Tzitzimime, and they seated them around Huitzilopochtli [Alvarado Tezozomoc 1878:486].

At this time, they placed a resplendent mirror (*xiuhtezcatl*) in front of Huitzilopochtli. Alvarado Tezozomoc (1878:486) mentioned that they also added a statue of the god's sister Coyolxauhqui and images of the ancient ancestors who came from Aztlan.

Although Durán (1967:22:333, 1992:328) provided only a few particulars about Ahuitzotl's renovation of A.D. 1487, he specifically cited the Tzitzimime sculptures. When he explained how the stonecutters began to carve idols for the Templo Mayor, he mentioned the pointed sacrificial stone, an image of Coyolxauhqui next to it, and two statues on the corners of the pyramid. He then added: "They set up two stone beasts [*bestiones*] that they called tzitzimites."[15] Figure 21 hints at the placement of these great figural sculptures, for it pictures distorted human faces on the door jambs of the twin temples.

Later when Durán (1967:2:344–345, 1992:338–340) described the bloody sacrifices that served to dedicate the Templo Mayor, the accompanying painting (Figure 22) illustrates the cult image in Huitzilopochtli's shrine as a monstrous, horned being, one so large that its feet extend down to the first step below the platform. It has claws and talons for hands and feet, an open and grimacing mouth, a protruding tongue, what looks like a smoking mirror at the temple, writhing serpents about its head, a necklace of what look like hearts, and two long serpents spinning outward from its lower body. The cult image of Tlaloc has claws for hands and feet, faces at the elbows and knees, a serpent tail, and a nearly unreadable face whose nose and fanged mouth are formed by curling serpents. With the exception of Tlaloc's face, which is characteristic of that deity, most of these elements are features of either the "Coatlicue" sculptures or the broader complex of supernaturals to which the "Coatlicue" statues belong.

[14] Durán (1967:2:229) here spoke of both *estatuas de piedra* and *bestiones*, which Heyden (Durán 1992:227) translated as "[architectural] support," and his text seems to blend the two. Durán, like Cortés (1986: 105–106), described the interior of the temple as being filled with relief carvings. Heyden (Durán 1992:227), in a footnote, cited me as having "suggested [in a personal communication] that the Coatlicue and Yolotlicue statues may have been supports of this type." Unfortunately this is incorrect. I do think the great statues are similar to these *ilhuicatzitzquique*, but not that they are supports. I investigated this latter possibility in 1973 and found that it was not possible, as explained in n. 15.

[15] Although, Ramírez (Durán 1867–1880:1:345) noted that *bestion* is an architectural term meaning "pilaster" or "atlantid," a supporting member that takes the form of a human or animal; the term should be read in this context as a grotesque animal figure of significant size and solidity, like the "Coatlicues." The "Coatlicue" was never an atlantid per se because its top surface (revealed in photographs kindly taken for me in 1973 by José de los Reyes Medina) is fully carved with the same webbed pattern, and the area where the upper lips of the two serpents meet is both too shallow and too undamaged to be a structural joint.

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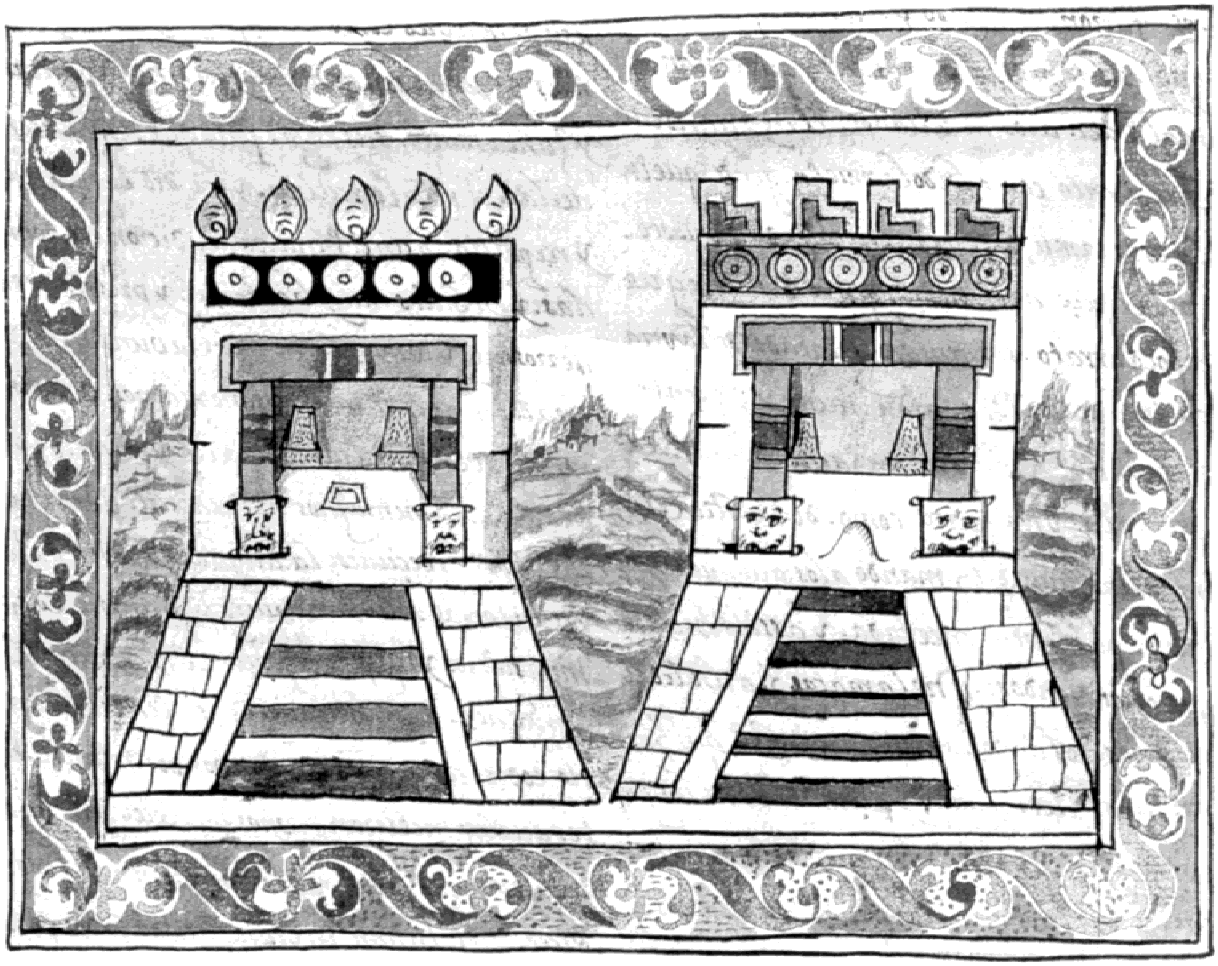


Figure 21. Templo Mayor, Diego Durán's *Historia* Folio 126v (photo courtesy Biblioteca Nacional, Madrid).

On the outside of the twin temples, the two hairy imps that float in the air and hold onto the sides of the shrines also have claws instead of hands and feet and what may be serpents around their faces. They are presented as already-sacrificed creatures, with their heart or liver exposed through an open slit in their chest. These cult figures and imps share some features with the "Coatlicue" statues.

This is not to say that Durán's artist accurately rendered the Templo Mayor as it was renovated by Ahuitzotl, or even as it appeared at the time of the conquest. Durán, as a man of his times, was influenced by early colonial analogies between the Aztec gods and the European devil, and his artists must have been influenced by the corresponding visual analogies (Boone 1989:67–71). The artist who painted this illustration of the Templo Mayor (Figure 22) surely drew from the European tradition of diabolical imagery—including monstrous faces with grimacing mouths and forked tongues, horns, serpents, tails, and claws—to describe the cult images at the Templo Mayor. After all, this was the illustration that introduced Durán's chapter on the sacrifices that marked the temple's dedication in A.D. 1487. However, most of the visual features that characterize these painted images do correspond to elements that characterize the Tzitzimime and other fierce females in Aztec iconography. Durán's artist clearly drew from a preexisting, indigenous visual foundation, one that included the memory of "Coatlicue"-like images at the Templo Mayor. Durán (1992:227) wrote that these statues, having been fixed to the corners of the royal palace, were visible (in A.D. 1570) when he was writing.

Andrés de Tapia brings us even closer to Huitzilopochtli's shrine and the great statues there at the time of the Spanish invasion. In his *Breve relación de la conquista*, the conqueror described the Templo Mayor and the images associated with it. He characterized the image of Huitzilopochtli as a figure made of seed dough (this would be a *tzoalli* image [Boone 1989:46–47]) and noted that it was accompanied by other large stone statues:

> Outside the hollow wall [apparently the shrine itself] were two idols on large stone bases the height of a measuring rod. The idols were nearly the height of three measuring rods, and the girth of an ox. They were of polished granite covered with mother-of-pearl. . . . Over this they used a glue in the form of a paste to incrust gold ornamentation, and designs of men, ser-

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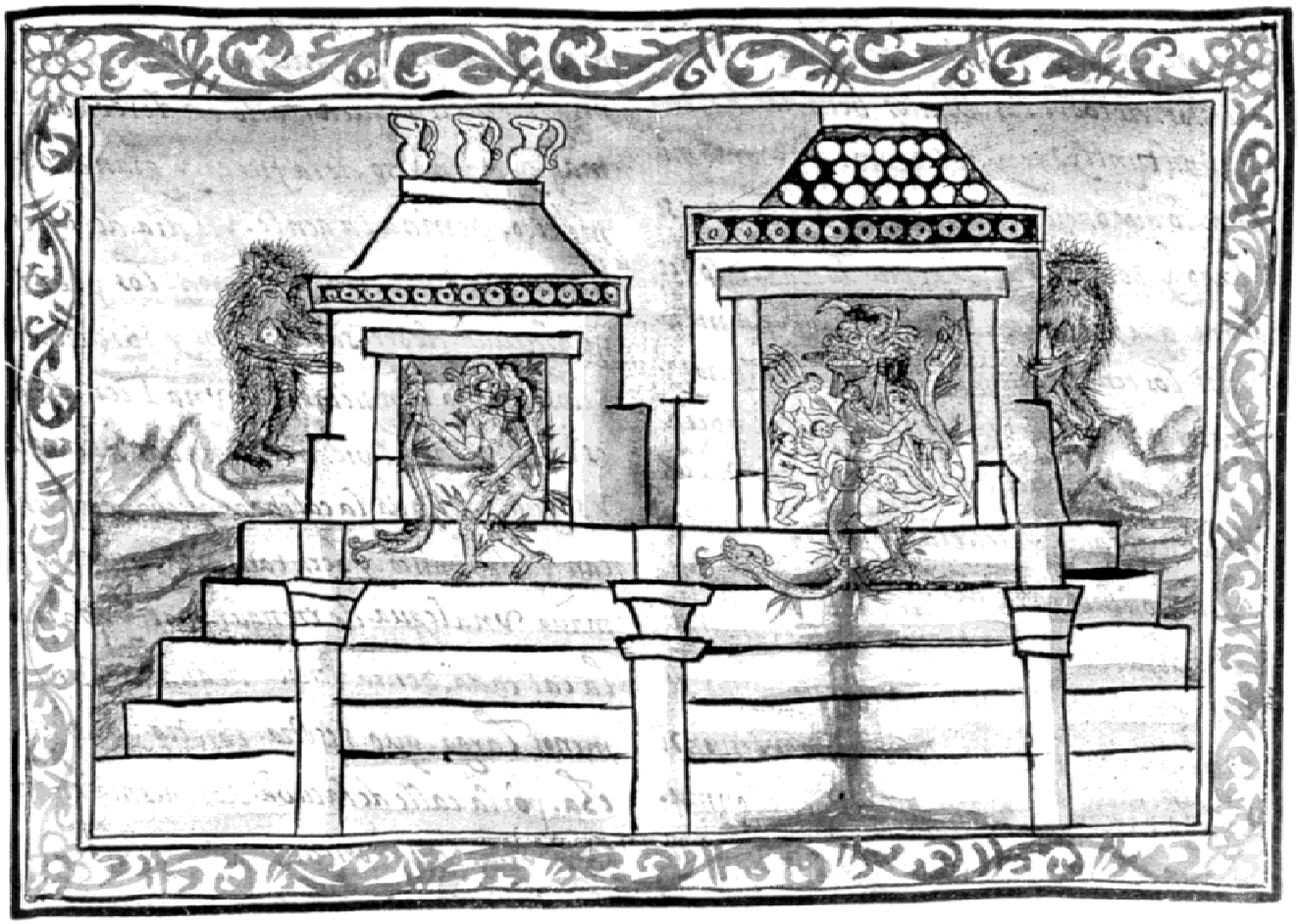


Figure 22. Templo Mayor, Diego Durán's *Historia* Folio 131v (photo courtesy Biblioteca Nacional, Madrid).

> pents, birds, and other figures made of large and small turquoises, emeralds, and amethysts, so that all of the mother-of-pearl was covered except in some places where they left it to make a design with the stones. These idols wore thick gold serpents, and for necklaces some ten or twelve human hearts made of gold. For faces they had gold masks with mirror eyes, and at the nape of the neck hung another face like a human head without flesh [Fuentes 1963:41].[16]

Jorge Gurría Lacroix (1978) argued that these massive granite idols exist today as the "Coatlicue" and "Yolotlicue," which are roughly the right size, are of andesite, have necklaces of alternating hearts and hands, have a skull attached at the back, and are girded in serpent belts. I previously thought that this identification ultimately failed because the gold, the jewels, and the other features of Tapia's statues are not found on the "Coatlicues" (Boone 1989:47). I now realize that I was taking Tapia too literally, and that Gurría Lacroix is right. If we step back from a literal interpretation of Tapia and consider his description in light of the text by Alvarado Tezozomoc and the illustrations and the text of Durán, it is clear that large Tzitzimitl-like statues were placed around the Templo Mayor. Tapia, like Durán, mentioned two, but there must have been others, perhaps on the sides or back.

Tapia and Durán's artist, I suggest, conflated a number of Aztec cult images to achieve almost archetypal monsters, ones that were both horrific and tantalizing to the European audience to which their works were directed. Their presentations are founded on the memory of huge anthropomorphic/zoomorphic statues at the Templo Mayor; these statues were of stone, had nonhuman faces, and were girded in great serpents, and they were adorned with heart necklaces and pendent skulls. Durán's artist recorded the fanged faces at the joints and recalled more serpent features (Figure 22). The gold, mother-of-pearl, and precious and semiprecious stones that Tapia emphasized may well be embellishments that the conqueror invented or mentally borrowed from other images and added

[16] Although Tapia's relation was not published until the late nineteenth century, it was available to Francisco López de Gómara (secretary to Cortés), who followed Tapia almost verbatim in describing the cult images at the Templo Mayor. López de Gómara (1943:1:244–245), however, gave priority to the two stone images and identified them as Huitzilopochtli and Tezcatlipoca. His description then became the standard for its time, repeated by Francisco Cervantes de Salazar, Bernal Díaz del Castillo, Antonio de Herrera, Bartolomé de las Casas, and Juan de Torquemada (for discussion, see Boone 1989:47–51).

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to reinforce the exotic richness of Aztec cult images. Tapia and Durán's artist may have emphasized those features that they considered the most important about these statues, that is, the features that qualified the statues as fearsome and unfathomable. Tapia stressed the rare and precious materials, whereas Durán's artist insisted on a strong analogy with the European devil.

HUITZILOPOCHTLI AND THE TZITZIMIME

Alvarado Tezozomoc and Durán identified the colossal statues that were placed around Huitzilopochtli at the Templo Mayor as Tzitzimime. As celestial demons and stars, usually conceptualized as females and blending with other fierce earth and heavenly supernaturals, the Tzitzimime promised to descend from the heavens to devour humankind if the sun were to fail. We must ask ourselves how these sculptures functioned ideologically within the overall iconographic program at the Templo Mayor. They clearly were significant elements in the program, because their creation was a major concern during several renovations. Unfortunately, the paintings and alphabetic texts that have come down to us from the early Colonial period do not easily and unequivocally tell us why the Tzitzimime were set up at the Templo Mayor. We have no equivalent to the legend of the birth of Huitzilopochtli, which explains Coyolxauhqui's existence so readily.

There are only suggestive hints in the statues' iconography and in the words of the chroniclers. The statues are large and massively formed. Because Alvarado Tezozomoc (1878:358) called them "angels of the air and sustainers of the sky" and Durán (1992:227) agreed they are "sustainers of the sky," they may simply function as sky bearers, metaphorically supporting the heavens around Huitzilopochtli as the sun. In this case, there may have been four of them, although Alvarado Tezozomoc (1878:361) reported on six that were carved for Moctezuma Ilhuicamina's renovation. But the "Coatlicues" are too iconographically complex to be merely sky bearers.

A key to their identity, I feel, lies in the year date, 12 Reed, carved between the shoulder blades of the "Coatlicue" and "Yolotlicue." This year is not well known for having strong ideological significance, but a passage in the *Anales de Cuauhtitlan* implies that it is the year in which the second Age or Sun began: "The second age is told and related to be the fifth sun, or age. 12 Reed. 13 Flint. 1 House. . . ." Later, the *Anales* described what happened in this sun: "4 Jaguar is the day sign of the second sun that there was, called Jaguar Sun. It happened that the sky collapsed then, and the sun did not continue. It happened at midday. Then there was darkness, and while it was dark, the people were eaten" (*Codex Chimalpopoca* 1992:25, 26).

Other texts differ in the order and detail of the suns. The *Leyenda de los Soles* (*Codex Chimalpopoca* 1992:142) described this jaguar sun as the first of the series of suns and stated that the people were eaten by "jaguars" and/or "man eaters." The *Histoyre du Mechique* (Garibay 1979:104) assigned this sun, which it called Yohualtonatiuh (Dark or Night Sun), to the third position and stated that humankind was devoured by "fierce beasts, that are called [blank!], that is to say giants." Because of the *Leyenda de los Soles* text, most scholars (e.g., Caso 1958:15; Nicholson 1971:398–399) have asserted that humankind was devoured by jaguars, but the other two texts make it much more likely that the ancient stories told of people being eaten by Tzitzimime, who are elsewhere referred to as fierce beasts and man eaters and who appear in times of darkness when the sun fails. The *Anales* also indicated that this second sun is related conceptually to the Fifth Sun, when humans are destined to be eaten by Tzitzimime.

If we can tie the year-date 12 Reed on the back of the colossal "Coatlicues" with this earlier sun, when humankind was devoured by Tzitzimime, the great stone statues become both the ancient man-eaters and those who threaten the present, Fifth Age. This link is supported by the iconography of the monoliths, which relates them to powerful women who existed in earlier times—such as Coatlicue, Itzpapalotl, and the Tzitzimitl grandmother of Mayahuel—and to other potentially dangerous spirits of the present—such as Cihuacoatl and the Cihuapipiltin.

A distinguishing and puzzling feature of the "Coatlicues" is that they are beheaded and dismembered. Their heads and hands, those very parts of the anatomy that do the killing and devouring, have been severed. This puts them in the company of conquered women such as Coyolxauhqui, who have been defeated by Huitzilopochtli. My sense is that the great statues represent Tzitzimime that have been defeated by Huitzilopochtli, the sun, whose appearance at dawn, after eclipses, and after the New Fire has been drilled for a 52-year cycle, effectively vanquishes the celestial demons of the night. Their placement around the status of Huitzilopochtli at the Templo Mayor demonstrated to the Aztec observer that Huitzilopochtli has conquered and rendered powerless the forces of destruction, the Tzitzimime, that threaten humankind in the Fifth Age. Like the Coyolxauhqui reliefs, the great "Coatlicue" statues affirm Huitzilopochtli's essential superiority over all other gods and forces.

In summary, the colossal sculpture known as the "Coatlicue" is not a single cult image but one of a larger set of statues that were placed around the image of Huitzilopochtli at the Templo Mayor. The iconographic elements that characterize these monumental stone images show them as belonging to the broad category of powerful, potentially dangerous, supernatural women that includes Coatlicue, Cihuacoatl, Itzpapalotl, and the Cihuapipiltin. Within this category, the sculptures can be identified as Tzitzimime, celestial demons belonging to both earlier ages and this Fifth Age, who threaten to descend and devour humankind if the sun fails to reappear after spells of darkness. The Tzitzimime are the very beings that Huitzilopochtli, as the sun god, must forestall and render impotent. The Aztec sculptors carved them as decapitated and dismembered creatures, whose presence at the Templo Mayor signaled Huitzilopochtli's ultimate superiority and victory.

RESUMEN

La colosal escultura "Coatlicue" ha sido usualmente interpretada como una representación de la supernatural Coatlicue (La de la Falda de Serpientes), quien dio a luz a Huitzilopochtli, el dios patrón de los mexicas. También ha sido identificada como la imagen de culto de Cihuacoatl (Mujer Serpiente), o de Tlaltecuhtli (Señor de la Tierra). Este trabajo ofrece una lectura alternativa de la monumental estatua, una que reconoce la existencia de

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por lo menos tres "Coalicues" casi idénticas, y por lo tanto recontextualiza al monumento como parte de un conjunto más grande. La iconografía de estas tres magníficas mujeres de piedra sugiere que su identidad es Tzitzimime, demonios celestiales que se pensaba descenderían para devorar a la humanidad si el sol no aparecía. De acuerdo a los cronistas mexicanos, un escuadrón de estos terroríficos monolitos dominaba el programa escultural del Templo Mayor.

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REFERENCES

Aguilera, Carmen
1997 Of Royal Mantles and Blue Turquoise: The Meaning of the Mexica Emperor's Mantle. *Latin American Antiquity* 8:3–19.

Alcocer, Ignacio
1935 *Apuntes sobre la antigua Tenochtitlan*. Instituto Panamericano de Geografía e Historia, Mexico.

Alvarado Tezozomoc, Fernando
1878 *Crónica mexicana*, edited by Manuel Orozco y Berra. Ireneo Paz, Mexico.

Anawalt, Patricia Rieff
1990 The Emperors' Cloak: Aztec Pomp, Toltec Circumstance. *American Antiquity* 55:291–307.
1993 Riddle of the Emperors' Cloak. *Archaeology* 46(3):30–36.
1996 Aztec Knotted and Netted Capes: Colonial Interpretations vs. Indigenous Primary Data. *Ancient Mesoamerica* 7:187–206.

Baquedano, Elizabeth
1993 Aspects of Death Symbolism in Aztec Tlaltecuhtli. In *The Symbolism in the Plastic and Pictorial Representations of Ancient Mexico*, edited by Jacqueline de Durand-Forest and Marc Eisinger. BAS No. 21, Bonner Amerikanistische Studien/Estudios Amerianistas de Bonn. Holos, Bonn.

Boone, Elizabeth H.
1989 *Incarnations of the Aztec Supernatural: The Image of Huitzilopochtli in Mexico and Europe*. American Philosophical Society Vol. 79 Pt. 2. Philadelphia.

Brehme, Hugo
1923 *Das malerische Mexiko*. Hugo Brehme, Mexico.

Carrera, Magali
1979 *The Representation of Women in Aztec-Mexica Sculpture*. Unpublished Ph.D. dissertation, Columbia University, New York.

Caso, Alfonso
1958 *The Aztecs: People of the Sun*. University of Oklahoma Press, Norman.
1959 Nombres calendáricos de los dioses. *El México Antiguo* 9:77–97.

Chavero, Alfredo
1882 La piedra del sol: estudio arqueológico. *Anales del Museo Nacional de México* 2:3–46, 107–126, 233–236, 292–310, 403–430.
1888 *México a través de los siglos: tomo primero: historia antigua y de la conquista*, edited by Vicente Riva Palacio. Espasa y Compañía, Barcelona.

Chimalpahin Quauhtlehuanitzin, Francisco de San Antón Muñón
1889 *Sixième et Septième Relations (1258–1612)*, translated by Rémi Siméon. Maisoneuve et. Ch. Leclerc, Paris.

Codex Aubin
1893 *Histoire de la Nation Mexicaine, . . . manuscrits figuratifs des anciens mexicains*, edited by J.M.A. Aubin. Ernest Leroux, Paris.

Codex Borbonicus
1974 *Codex Borbonicus. Bibiothèque de l'Assemblée Nationale—Paris (Y-120)*. Akademische Druck- u Verlagsanstalt, Graz.

Codex Borgia
1976 *Codex Borgia. Biblioteca Apostolica Vaticana (Messicano Riserva 28)*. Akademische Druck- u. Verlagsanstalt, Graz.

Codex Chimalpopoca
1992 *History and Mythology of the Aztecs: The Codex Chimalpopoca*, translated by John Bierhorst. University of Arizona Press, Tucson.

Codex Magliabechiano
1970 *Codex Magliabechiano CL. XIII, 3 (B.R.232), Biblioteca Nazionale Centrale di Firense*. Akademische Druck- u. Verlagsanstalt, Graz.

Codex Mendoza
1992 *Codex Mendoza*, edited by Frances F. Berdan and Patricia Rieff Anawalt. 4 vols. University of California Press, Berkeley.

Codex Ríos (Codex Vaticanus A)
1900 *Il Manoscritto Messicano Vaticano 3738 detto il Codice Ríos*, edited by Franz Ehrle. Stabilimento Danesi, Rome.
1979 *Codex Vaticanus 3837 ("Cod. Vat. A," "Cod. Ríos") der Biblioteca Apostolica Vaticana*. Akademische Druck- u. Verlagsanstalt, Graz.

Codex Telleriano-Remensis
1995 Reproduced in *Codex Telleriano-Remensis. Ritual, Divination, and History in a Pictorial Aztec Manuscript*, by Eloise Quiñones Keber, pp. 3–104. University of Texas Press, Austin.

Codex Tudela
1980 *Códice Tudela*, edited by José Tudela de la Orden. 2 vols. Ediciones Cultura Hispánica, Madrid.

Cortés, Hernan
1986 *Hernan Cortés, Letters from Mexico*, translated by Anthony Pagden. Yale University Press, New Haven.

del Castillo, Cristóbal
1991 *Historia de la venida de los mexicanos y otros pueblos e Historia de la conquista*, translated by Federico Nacarrete Linares. Instituto Nacional de Antropología e Historia, Mexico.

Durán, Diego
1867–1880 *Historia de las Indias de Nueva España e Islas de Tierra Firme*, edited by José Fernando Ramírez. 2 vols and atlas. Andrade y Escalante, Mexico.
1967 *Historia de las Indias de Nueva España e islas de Tierra Firme*, edited by Angel María Garibay K. 2 vols. Editorial Porrúa, Mexico.
1971 *Book of the Gods and Rites and The Ancient Calendar*, translated by Fernando Horcasitas and Doris Heyden. University of Oklahoma Press, Norman.
1992 *The History of the Indies of New Spain*, translated by Doris Heyden. University of Oklahoma Press, Norman.

Fernández, Justino
1954 *Coatlicue: Estética del arte indígena antiguo*. Universidad Nacional Autónoma de México, Mexico.
1966 El Mictlan de Coatlicue. *Estudios de Cultura Náhuatl* 6:47–53.

https://doi.org/10.1017/S0956536199102098 Published online by Cambridge University Press

Fuentes, Patricia de
1963 *The Conquistadors: First Person Accounts of the Conquest of Mexico*. Orion Press, New York.
Garibay K., Angel María
1979 *Teogonía e historia de los mexicanos: Tres opúsculos del siglo XVI*. Editorial Porrúa, Mexico.
Graulich, Michel
1991 Les grandes statues aztèques dites de Coatlicue et de Yollotlicue. In *Cultures et societes Andes et Meso-Amériques: Mélanges en hommage à Pierre Duviols*, edited by Raquel Thiercelin, pp. 375–419. Université de Provence, Aix-en-Provence.
Gurría Lacroix, Jorge
1978 Andrés de Tapia y la Coatlicue. *Estudios de Cultura Náhuatl* 13:23–34.
Gutiérrez Solana Rickards, Nelly
1990 *Objectos ceremoniales en piedra de la cultura mexica*. Universidad Nacional Autónoma de México, Mexico.
Heyden, Doris
1971 Comentarios sobre la Coatlicue recuperada durante las excavaciones realizadas para la construcción del Metro. *Anales del Instituto Nacional de Antropología e Historia*, Period 7a, 2(1969):153–170.
1974 La diosa madre: Itzpapalotl. *Boletín del Instituto Nacional de Antropología e Historia*, Period 2, 11:3–14.
Katz, Leo
1945 Art and Archaeology in the Aztec Figure of Coatlicue. *Magazine of Art* 38(4):133–137.
Klein, Cecelia F.
1988 Rethinking Cihuacoatl: Aztec Political Imagery of the Conquered Woman. In *Smoke and Mist: Mesoamerican Studies in Memory of Thelma D. Sullivan*, edited by J. Kathryn Josserand and Karen Dakin, pp. 237–277. BAR International Series 402. British Archaeological Reports, Oxford.
1994 Fighting with Femininity: Gender and War in Aztec Mexico. *Estudios de Cultura Náhuatl* 24:219–253.
2000 The Devil Was a Skirt: Colonial vs. Prehispanic Images of the Tzitzimime. *Ancient Mesoamerica*, forthcoming.
León y Gama, Antonio
1792 *Descripción histórica y cronológica de las dos piedras*. Felipe de Zúñiga y Ontiveros, Mexico.
López Austin, Alfredo
1983 Nota sobre la fusión y la fisión de los dioses en el panteón mexica. *Anales de Antropología II, Etnología y Linguística* 20(2):75–87.
López de Gómara, Francisco
1943 *Historia de la conquista de México*, edited by Joaquín Ramírez Cabañas. 2 vols. Pedro Robredo, Mexico.
Marquina, Ignacio
1960 *El Templo Mayor de México*. Instituto Nacional de Antropología e Historia, Mexico.
Mateos Higuera, Salvador
1979 Herencia arqueológica de México-Tenochtitlan. In *Trabajos arqueológicos en el centro de la ciudad de México*, edited by Eduardo Matos Moctezuma, pp. 205–268. Map. Instituto Nacional de Antropología e Historia, Mexico.
Matos Moctezuma, Eduardo
1997 Tlaltecuhtli: Señor de la tierra. *Estudios de Cultura Náhuatl* 27:15–40.
Matricula de Tributos
1980 *Matricula de Tributos (Códice de Moctezuma), Museo Nacional de Antropología, Mexico (Codex 35-52)*. Akademische Druck- u. Verlagsanstalt, Graz.
Molina, Alonso de
1970 *Vocabulario en lengua castellana y mexicana y mexicana y castellana*, edited by Miguel León-Portilla. Editorial Porrúa, Mexico.
Muñoz Camargo, Diego
1947 *Historia de Tlaxcala*, edited by Alfredo Chavero. Ateneo Nacional de Ciencias y Artes de México, Mexico.
Nicholson, H.B.
1955 The Birth of the Smoking Mirror. *Archaeology* 7(3):164–170.
1967 A Fragment of an Aztec Relief Carving of the Earth Monster. *Journal de la Société des Américanistes*, n.s., 56(1):81–94.
1972 *The Iconography of Aztec Period Representations of the Earth Monster: Tlaltecuhtli*. Religion en Mesoamerica: XII Mesa Redonda. Sociedad Mexicana de Antropología, Mexico.
1971 Religion in Pre-Hispanic Central Mexico. In *Handbook of Middle American Indians*, vol. 10, edited by Robert Wauchope, Gordon Eckholm, and Ignacio Bernal, pp. 395–446. University of Texas Press, Austin.
Nicholson, H.B., in collaboration with Eloise Quiñones Keber
1983 *Art of Aztec Mexico: Treasures of Tenochtitlan*. National Gallery of Art, Washington, DC.
Pasztory, Esther
1983 *Aztec Art*. Harry N. Abrams, New York.
Quiñones Keber, Eloise
1995 *Codex Telleriano-Remensis. Ritual, Divination, and History in a Pictorial Aztec Manuscript*. University of Texas Press, Austin.
Ruiz de Alarcón, Hernando
1984 *Treatise on the Heathen Superstitions That Today Live among the Indians Native to This New Spain, 1629*, translated and edited by J. Richard Andrews and Ross Hassig. University of Oklahoma Press, Norman.
Sahagún, Bernardino de
1950–1982 *Florentine Codex: General History of the Things of New Spain*, translated and edited by Arthur J.O. Anderson and Charles Dibble. School of American Research and the University of Utah, Santa Fe.
1979 *Códice Florentino*. 3-volume facsimile. Archivo General de la Nación, Mexico.
1993 *Primeros Memoriales*, translated and edited by Thelma Sullivan et al. University of Oklahoma Press, Norman.
Seler, Eduard
1902–1923 *Gesammelte Abhandlungen zur amerikanische Sprach- und Alterthumskunde*. 5 vols. E. Asher, Berlin.
1963 *Comentarios al Códice Borgia*, translated by Mariana Frenk from the German edition of 1904. 3 vols. Fondo de Cultura Económica, Mexico.
1992 *Collected Works in Mesoamerican Linguistics and Archaeology*, vol. 3, translated under the supervision of Charles P. Bowditch, edited by Frank E. Comparato. Labyrinthos, Culver City, CA.
Solís, Felipe
1991 *Gloria y fama mexica*. Smurfit Cartón y Papel, Mexico.
Sullivan, Thelma
1966 Pregnancy, Childbirth, and the Deification of the Women who Died in Childbirth. *Estudios de Cultura Náhuatl* 6:63–95.
Thompson, J. Eric S.
1934 Sky Bearers, Colors, and Directions in Maya and Mexican Religion. *Contributions to American Archaeology* 436(10):209–242. Carnegie Institution of Washington, Washington, DC.
Tonalamatl Aubin
1900 *The Tonalamatl of the Aubin Collection*, edited by Eduard Seler. Hazell, Watson, and Viney, London.
Torquemada, Juan de
1975 *Monarquía indiana*, edited by Miguel León-Portilla. 6 vols. Universidad Nacional Autónoma de México, Mexico.
Umberger, Emily
1981 *Aztec Sculptures, Hieroglyphs and History*. Unpublished Ph.D. dissertation, Department of Art History and Archaeology, Columbia University, New York.

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