Aztec Flower-Flutes
The Symbolic Organization of Sound in Late Postclassic Mesoamerica

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ZUSAMMENFASSUNG

Unter Berücksichtigung aller Quellen können Klangartefakte als vielschichtige Zeichen einer archäologischen Musikkultur interpretiert werden, wie anhand aztekischer Spaltflöten aus Keramik, den „Blumenflöten", gezeigt wird. Die zeremonielle Funktion dieser Instrumente legt nahe, dass das aztekische Weltbild in einer festgelegten Organisation bestimmter Klänge reflektiert wurde.

1. ORGANOLOGY

Among the Aztec ceramic aerophones preserved in the *Ethnologisches Museum* in Berlin are a dozen tubular duct-flutes and many fragments of the same type, which were collected by Uhde, Strebel and Bauer in the Valley of Mexico between 1861 and 1908. The sound artefacts date to Late Postclassic Mesoamerica (1350–1521 A.D.; Fig. 1) and are called flower-flutes on account of their shape and cultural context.[1] They are characterized by (1) a long duct, (2) a framed aperture, (3) a tube with four fingerholes and (4) a bell in the shape of a blossom with the standardized relief structure of petals and abstract signs (Figs. 2 and 3).

The specimens preserved in Berlin are between 18 and 23 cm in length and weigh from 45 to 75 grams.[2] They are made from ochre or grayish clays which had been polished and sometimes painted before baking. Preferred colours are dark reddish-brown or carmine except for the space between the aperture-frames and the bell, which may be left uncoloured, painted white or blue. Two or three red stripes around the tube are always located between the first and the third fingerhole (Fig. 2).[3] When the flutes are held with one hand,[4] it can be demonstrated that the stripes mark exactly the point where the thumb best supports the instrument, even when playing with all the fingerholes open (Fig. 4). As such they do not seem to indicate a specific finger-combination. While fracture points are mainly recorded at the join between the tube and the bell, a large number of single bells are preserved in good condition.

Flutes of the same type have been studied by Cresson[5] and Castañeda[6] with emphasis on the tonal possibilities. Martí[7] discussed the cultural background, but took as his reference a different type excavated in Tizatlán, Tlaxcala, consisting of an angled trapezoid mouthpiece, a conical tube and a flat bell in the shape of a blossom.

2. ACOUSTICS

In total, the condition of six flower-flutes was good enough to be studied acoustically. Experimental playing produces both extremely shrill sound effects, which can be almost painful, and melodies with a very clear, sharp timbre. According to a sixteenth century account given by the Dominican missionary Fray Diego Durán, the sound of the flower-flute was perceived likewise as "very shrill", "sharp" and "high".[8]

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1 The recorded Nahuatl-terminology of aerophones allows no definite typological classification. A generic term widely applied to Aztec tubular duct-flutes is *tlapitzalli*, which could be translated as "that which is there when one blows something" (Bierhorst 1985, 348). Although various types have been excavated, only two more specific terms are recorded, *tlapitzayaxochimecatl*, "flute entwined with flowers" (after Schultze Jena 1957, 50–51, "Blumenumwundene Flöte"), and *quetzalchalchiuhtlapitzalli*, "plume-jade-flute" (Bierhorst 1985, 348).

2 Martí (1968, 141) recorded specimens with a length of 15 to 26 cm.

3 This figurative painting also could be incised but with transverse bars and interposed spots (Fig. 2, flute IV Ca 48153).

4 Martí 1953, 149–150.

5 Cresson 1883.

6 Castañeda 1930.

7 Martí 1953.

8 After Durán 1984, vol. I, 39, "muy agudo".

To determine the total sound capacity, all 16 possible finger-combinations were played with both minimum and maximum air-pressure, as gentle and as loud as possible. The lowest and the highest playable tone per position was recorded with a 440 hz A-calibrated chromatic tuner (Figs. 5 a and 5 b). It could be demonstrated that it is impossible to overblow, but a single finger-combination can produce a pitch-deviation from a minimum of 160 cents (Fig. 5 a, combination O I I I) to a maximum of 630 cents (Fig. 5 b, combination I I O O). Considering that the playing techniques are unknown, reconstructions leading to the determination of pentatonic scales, as presented on the basis of five flower-flutes preserved in the *Museo Nacional de Antropología e História* in Mexico-City, are highly hypothetical.[9] This does not exclude that melodies of four or five specific tones could have been of importance.

3. MUSIC ICONOLOGY

A context for instrumental use is evident in two depictions of the sixteenth century *Codex Florentinus*, compiled by the Franciscan missionary Fray Bernardino de Sahagún.[10] The first depiction shows an elaborated costumed instrumentalist with a flower-flute (Fig. 6 a). Its structure is correctly sketched, but the number of fingerholes is incorrect, since Aztec tubular flutes were generally restricted to the symbolic number of four fingerholes.[11] The flutist carries several plants with buds in the other hand and wears a crown of flowers and feathers, indicating his high status. A man and a woman kneel before him and look at the flower-flute. The second depiction shows four broken specimens covering the staircase of a temple platform, while four offering priests perform a ritual human sacrifice by heart extraction (Fig. 6 b). As in the first depiction, the shape corresponds to the characteristics of the flower-flutes, but the number of fingerholes is incorrect.

4. ETHNOHISTORY

Sahagún[12] and Durán[13] demonstrate that the instruments served an important function in the cult of *Tezcatlipoca* ("the smoking mirror"), an omnipresent Aztec deity related to the night and the jaguar.[14] Their accounts will be stated briefly.

In the *Toxcatl*-ceremony performed for 20 days in springtime, a young war-captive with the best appearance and personal qualities was chosen to personify *Titlacahuan* ("of whom we are slaves"), a manifestation of *Tezcatlipoca* associated with an unconditional readiness to sacrifice oneself for the welfare of the community.[15] The ritual costume was given to him in person by the Aztec ruler and comprised a crown of flowers and feathers, as depicted in the *Codex Florentinus* (Fig. 6 a), pendants of turquoise mosaic and golden ankle bells (*oyoalli*). A black paste containing strong psychoactive substances was applied to his legs and in stripes to his face.

The impersonator lived in the temple precinct of the Aztec ceremonial center Tenochtitlan (Fig. 1) in return for a final year of life filled with dignity and reverence. Head priests carefully taught him to dance and to play the flower-flute. Then, always accompanied by eight guards, he could appear in public playing the flute at any time. On hearing the characteristic sound, the people became aware of the presence of *Tezcatlipoca* and performed the "ritual of eating earth" (*tlalqualiztli*) to pray and attest to the observance of principal cultural norms, as depicted in the *Codex Florentinus* (Fig. 6 a). According to a court oration, the ruler himself was compared to the flute, through which *Tezcatlipoca* could express his will.

At the beginning of the following *Toxcatl*-ceremony, the impersonator was ritually wedded to four young women representing rain and fertility goddesses. Solemn feasts and dances of the Aztec nobility were held in his honour, in particular during the last five days of the ceremony. On the day of his sacrificial death he was taken by canoe to the eastern shore of the lagoon and a procession departed from *Tlapitzahuayan* ("the place of the flute") to a hillside sanctuary called *Tlacochcalco* ("at the spear house").[16] On arrival the impersonator ascended the stairway to the temple platform shattering one of the flutes with each step, before he was sacrificed on top as depicted in the *Codex Florentinus* (Fig. 6 b). At this moment the successor was chosen, and a new cycle began.

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9 See Stevenson 1968, 81–82.
10 Sahagún 1950–1982, vol. III, Fig. 7; vol. II, Fig. 17.
11 See Castellaños 1970, 51–54.
12 Sahagún 1950–1982, vol. II, 9–10, 64–73; vol. III, 10–11; vol. VI, 50.
13 Durán 1984, vol. I, 37–45.
14 Nicholson 1971, 412.
15 Seler 1902–1923, vol. IV, 63.
16 The settlement *Tlapitzahuayan* was identified with site Ix-A-34 at modern Tlalpizáhuac, Estado de México, and the *Tlacochcalco*, an "isolated ceremonial center", with site Ix-A-35 at the Cerro Pino at about 1 km to the north of Tlalpizáhuac (Fig. 1). The unexcavated mound is built upon a two-stage platform with remains of a staircase at its western side (see Parsons/Kintigh/Gregg 1983, 78–79; Berdan/Blanton/Boone/Hodge/Smith/Umberger 1996, 256).

5. SYMBOLISM

The symbolic value of the flower (*xochitl*) is crucial to an understanding of the perception of music in Late Postclassic Mesoamerica.[17] Appearing repeatedly in the cult of *Tezcatlipoca*, flowers were associated with beauty, virtuosity and music,[18] as well as with the offering of blood.[19] Indeed, the heart of a deity impersonator itself was compared to a flower, metaphorically 'plucked' and offered in ritual human sacrifice. Analogously the impersonator 'plucked' the flutes before his own death, as symbolized in breaking the bells from the tube over the stairway and leaving them as undamaged as possible. This act of ritual destruction is clearly evident by organological data and could be interpreted as a process of transformation into the spiritual realm.

The Aztec concept of music as a "flowery song" is reflected in the calyx-shape of the flower-flute. To play it allows to visualize the metaphorical link between sound and the scent of blossoms, both regarded as sacrificial gifts functioning as a means of communication with the spiritual realm, probably because of their invisible sensual quality. That the ruler was compared to the flute, through which *Tezcatlipoca* could express his will, makes the important social function of the instrument evident and shows that instrumental sound was perceived as the proper voice or 'flowery song' of a deity. Thus, the flutist fulfilled the role of a mediator.[20] It can be proposed that he was sacrificed instead of the ruler.

Aztec numerical symbolism and cosmovision offer still broader insights. First, the number '4' (*nahui*) and its multiples appear repeatedly in the cult of *Tezcatlipoca*, not only in the number of guards, wives or sacrificial priests of the impersonator, but also in the number of the fingerholes and the symbolic decoration of the bells of the flower-flutes. Of primary interest is the sign *tonallo* consisting of four circles in a square placed between four abstract petals (Figs. 7 and 8). It was also represented on the throne of *Tezcatlipoca*,[21] and associated with the deities of music and dance.[22] Furthermore, in close relation to the sign *nahui ollin* ("4-movement"), it corresponded to the belief in the dynamic of four world-ages and a world divided into quadrants circumvented by the sun.[23] The cardinal directions were related to the number '4',[24] and among other symbols associated with four petals of a flower, as depicted on the bells. Astronomically fixed by the axially connected sunrise and sunset points of the solstices, the point of intersection was believed to be the center of the world (Fig. 9).[25] As the solstices can be observed from any given position, any ceremonial objective could become this spatial and spiritual center, which was related to the number '5' (*macuilli*) and associated with a precious green stone.

The way in which Aztec cosmovision was reflected in musical practice is evident from an important account given by Durán:
"[...] salía una dignidad de las de aquel templo, que le llamaban *Titlacahuan*, vestido a la mesma manera que el ídolo [*Tezcatlipoca*]. Estaba con unas rosas en las manos y una flautilla de barro pequeña, de un sonido muy agudo. Y vuelto hacia la parte de oriente, tocaba la flautilla, y vuelto hacia occidente, hacia lo mesmo, y vuelto al norte, lo mesmo, y a la parte sur. Acabado de taner su flauta hacia las cuatro partes del mundo, todos los presentes que lo oían, ponían el dedo en el suelo, y cogiendo tierra en él. [...] este indio tañia esta flautilla, en las cuatro partes dichas, para que todos hiciesen aquella ceremonia de comer tierra [*tlalqualiztli*] y de pedir a los dioses las cosas que querían y lo que deseaban, haciendo oración, alzando los ojos al cielo [...]".[26]

Taking into consideration all relevant data, profound conclusions about the rich cultural background of ceremonial music in Late Postclassic Mesoamerica can be drawn. The flower-flutes demonstrate that a single sound artefact can be interpreted comprehensively as a multifaceted sign of an ancient musical culture. Instrumental sound was related symbolically to specific deities and became an integral constituent part of the cosmos, as it was directionally organized. Whether any specific tones or melodies were related to the four quadrants of the world is a matter for further discussion.

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17 See Stanford 1984, 68–9.
18 Seler 1902-1923 Vol. II, 491.
19 Garibay 1953-1954 Vol. I, 382–383.
20 Olivier 1997, 255–256.
21 *Codex Magliabechiano* 1983, vol. I, fol. 33r.
22 Seler 1902-1923, vol. II, 311, Fig. 35 c; Caso 1958, 47.
23 See Seler 1904–1924, vol. II, 493.
24 Nicholson 1971, 403–406; Townsend 1979, 37–40.
25 See Aveni 1980.
26 Durán 1984, vol. I, 39–40. – Horcasitas and Heyden (Durán 1971, 101) translate: "[*Titlacahuan*] came out of the temple, [...] dressed in the same clothes as the idol [*Tezcatlipoca*], carrying flowers in his hands and a small clay flute which gave forth a shrilling sound. Turning to the east, he played the flute, and, turning respectively to the west, north and south, he did the same. After he had played the flute in the direction of the four parts of the world, all those present and those who were absent but who could hear him, placed a finger on the ground, smearing it with earth, whereupon they placed it within their mouths. [...] the man with the flute blew it in the four directions so that all would perform the rite of eating the earth and of begging the gods for the things they coveted. They prayed, lifting their eyes toword the heavens [...]." The musical practice probably was called *nauhpa xictlayahualochti in chalchiuhteyahualco* ("carry something [i.e. the musical instrument or the sound] four times in all directions round the precious circular green stone [i.e. the center of the world]"), as related in the Legend of the Suns in reference to the shell trumpet (Lehmann 1974, 331; Ruhnau 2001, pers. communication). Lehmann did not take into consideration the probable relationship of this metaphor to musical practice.

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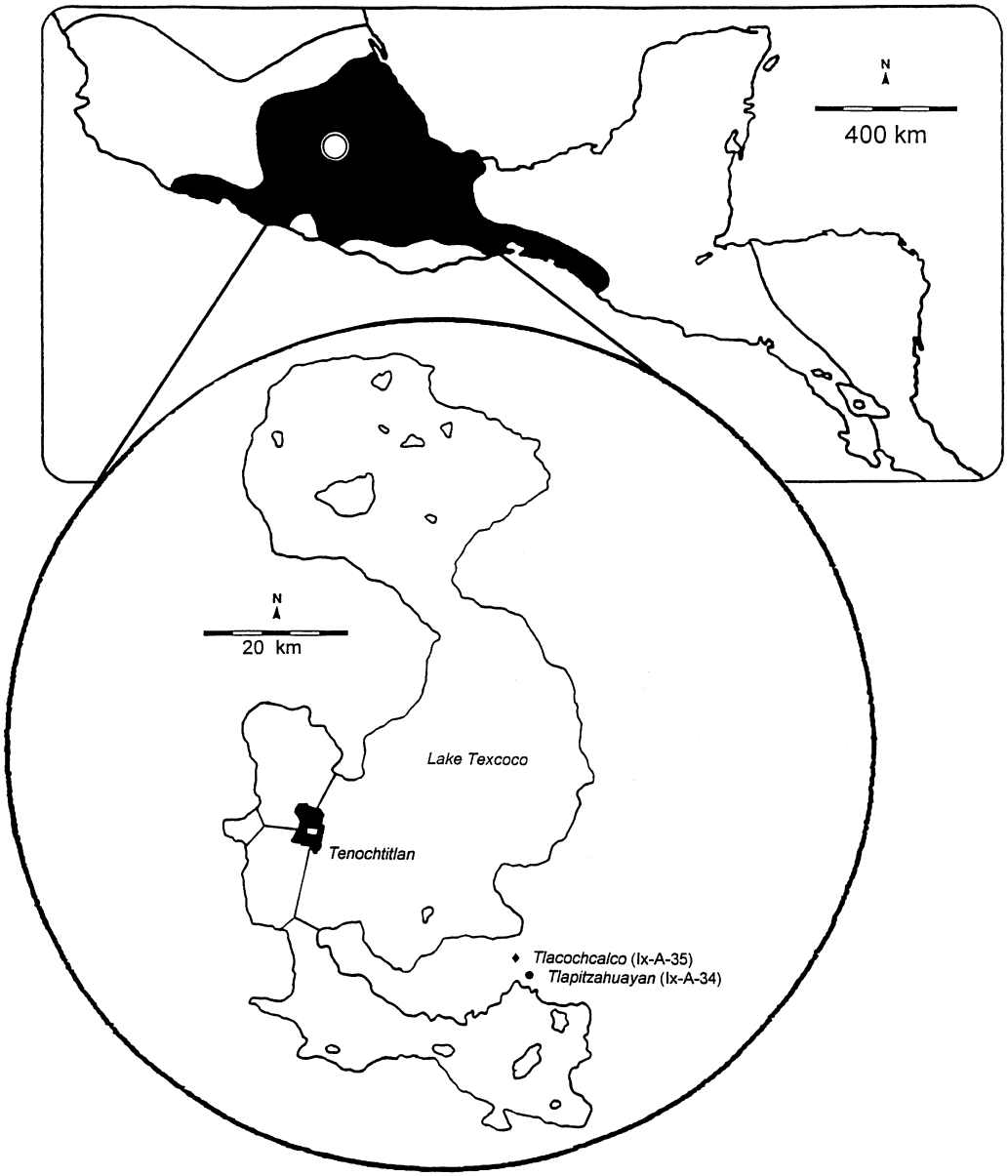

Fig. 1 Mesoamerica and Aztec territory, 1520 A.D., Valley of Mexico.

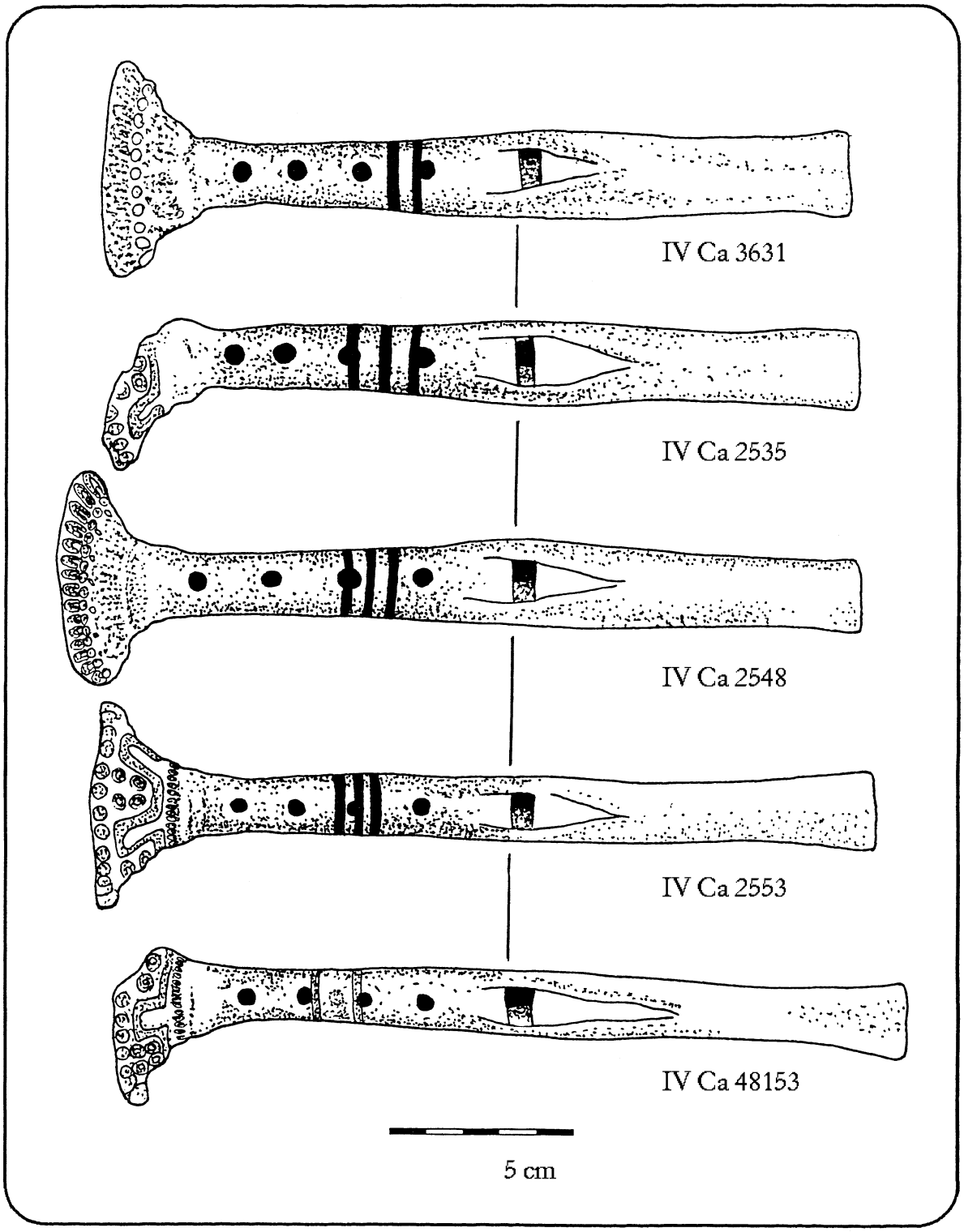

Fig. 2 Aztec flower-flutes, Valley of Mexico (1350–1521 A.D.).
Ethnologisches Museum Berlin, SMB PK, Drawing: C. Koch.

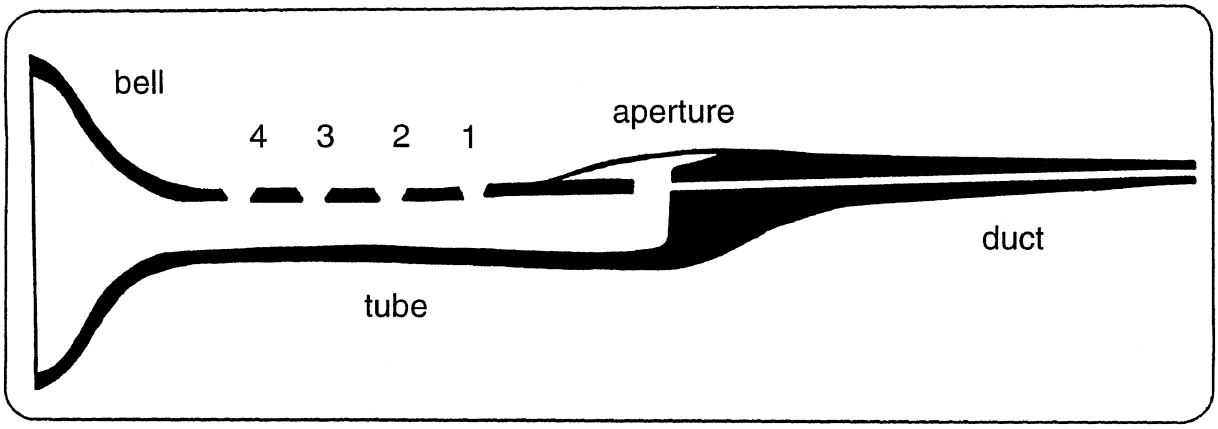

Fig. 3 Transection.

Fig. 4 Playing posture (flute IV Ca 2553, Ethnologisches Museum Berlin, SMB PK).

IV Ca 2535

tablature fingerholes 1	2	3	4	C 1 0 Cent	C# 100 Cent	D 200 Cent	D# 300 Cent	E 400 Cent	F 500 Cent	F# 600 Cent	G 700 Cent	G# 800 Cent	A 900 Cent	A# 1000 Cent	B 1100 Cent	C 2 1200 Cent	C# 1300 Cent	D 1400 Cent	D# 1500 Cent	E 1600 Cent
O	O	O	O														-40		0	
O	O	O	I													-30		+40		
O	O	I	O													-30		-20		
O	I	O	O												-35		0			
O	O	I	I												-35		-10			
O	I	O	I											+10		+30				
I	O	O	O										+10		+40					
I	O	O	I										-10		+25					
O	I	I	O										-10		0					
I	O	I	O										-20		-5					
I	O	I	I									-20		+15						
O	I	I	I									-20	+40							
I	I	O	O							-20		+50								
I	I	O	I						-25			+15								
I	I	I	O					-20			+45									
I	I	I	I			+20			-15											

Fig. 5 a Pitch-deviation per finger combination of flute IV Ca 2535 in cent (A = 440 hz).
O = fingerhole open, I = fingerhole closed.

IV Ca 3631

tablature fingerholes 1	2	3	4	C 1 0 Cent	C# 100 Cent	D 200 Cent	D# 300 Cent	E 400 Cent	F 500 Cent	F# 600 Cent	G 700 Cent	G# 800 Cent	A 900 Cent	A# 1000 Cent	B 1100 Cent	C 2 1200 Cent	C# 1300 Cent	D 1400 Cent	D# 1500 Cent	E 1600 Cent
O	O	O	O												+40				+30	
O	O	O	I												-20				-10	
O	O	I	O												-20			+45		
O	I	O	O										+10					-45		
O	O	I	I										+10				+30			
O	I	O	I									+20					0			
I	O	O	O									-40				+15				
I	O	O	I									-40				0				
O	I	I	O								-30				+20					
I	O	I	O						0						-30					
I	O	I	I						-20					+35						
O	I	I	I					0						-40						
I	I	O	O				+30							-40						
I	I	O	I			-10							0							
I	I	I	O			-30						+20								
I	I	I	I		+10					+10										

Fig. 5 b Pitch-deviation per finger combination of flute IV Ca 3631 in cent (A = 440 hz).
O = fingerhole open, I = fingerhole closed.

Fig. 6 a *Tezcatlipoca-Titlacahuan* after Sahagún (1950–1982 Vol. III: Fig. 7).

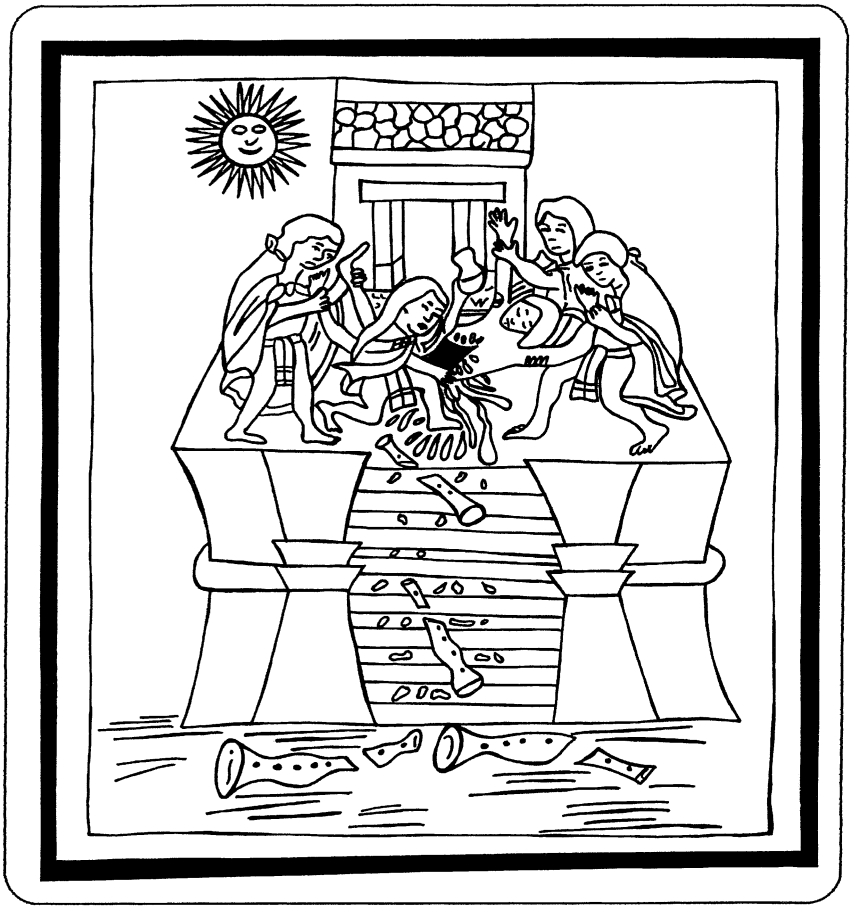

Fig. 6 b The sacrifice of *Tezcatlipoca-Titlacahuan* after Sahagún (1950–1982 Vol. II: Fig. 17).

Fig. 7 Bell (flute IV Ca 48153, Ethnologisches Museum Berlin, SMB PK).

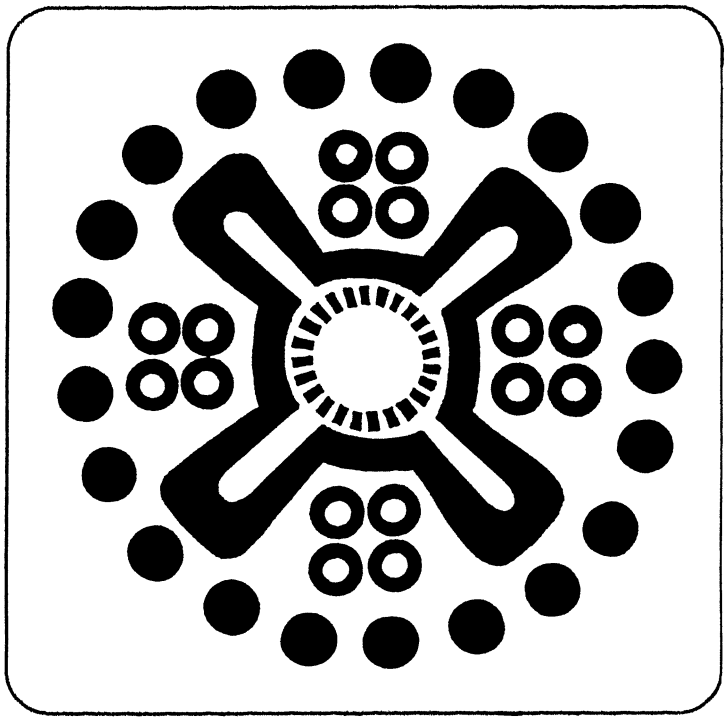

Fig. 8 Bell-motif of four petals with the *tonallo*-sign.

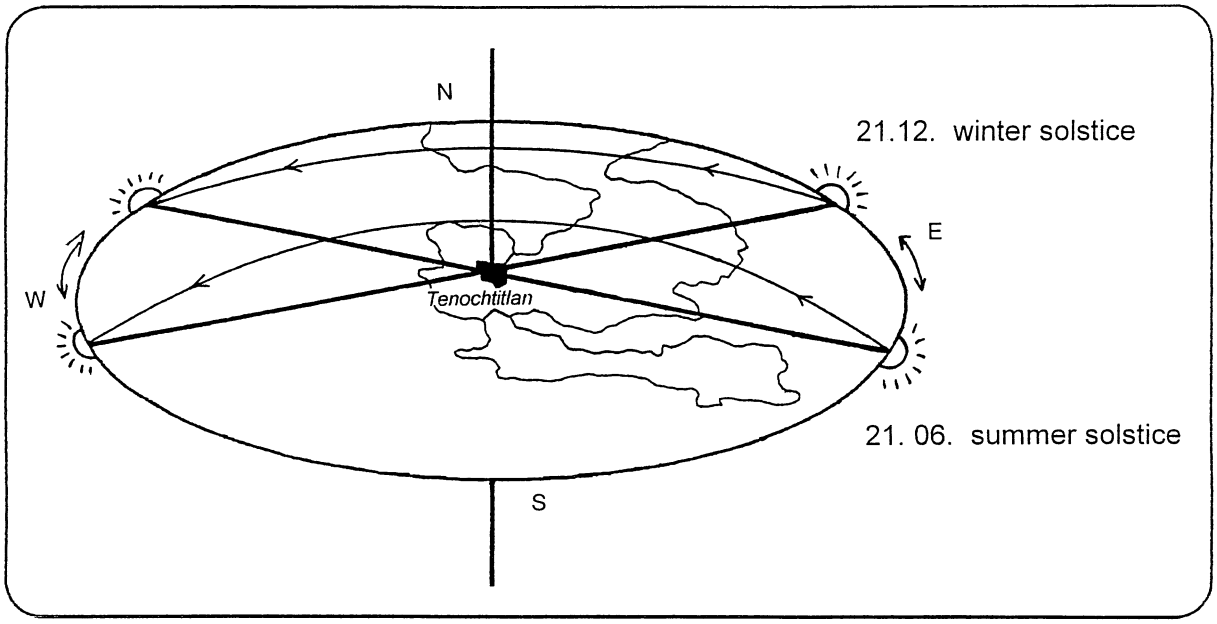

Fig. 9 The Aztec worldview of four cardinal directions.