On the Context of Imitative and Associative Processes in Prehispanic Music

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ZUSAMMENFASSUNG

Imitative und assoziative Prozesse zählen zu Prinzipien der vorspanischen Musik, die sich auch in den erhaltenen Klangartefakten widerspiegeln. Mögliche Aufschlüsse im Hinblick auf den spezifischen Kontext dieser Prozesse sind bisher allerdings kaum diskutiert worden. In diesem Essay wird der Versuch eines ersten Überblicks unternommen. Nach vorläufiger Beurteilung ist darauf zu schließen, dass imitative und assoziative Prozesse in der vorspanischen Musik einem vielschichtigen Symbolgefüge zugrunde lagen, das fest in der indigenen Weltsicht verwurzelt war.

> Song at the Beginning[1]
> Truly as I walk along I hear the rocks as it were replying to the sweet songs of the flowers; truly the glittering, chattering water answers, the bird-green fountain, there it sings, it dashes forth, it sings again; the mockingbird answers; perhaps the *coyol* bird answers, and many sweet singing birds scatter their songs around like music. They bless the earth pouring out their sweet voices.

1. INTRODUCTION

Sound imitation is an advanced adaptive behaviour, observed frequently among mammals, such as human beings, whales and dolphins, and members of the avifauna, such as song birds, parrots, and ravens[2]. It is a complex behaviour that implies a cognitive process, whereby a sound is perceived and reproduced. It requires a careful observation of the sounds that animate the environment, but also the wherewithal to replicate acoustical phenomena through vocal intonation and, exclusively among human beings, sound-producing devices and musical instruments.

Without doubt, the ability to imitate acoustical phenomena represents a powerful means of communication with the external world. Among birds, but also mammals, such as whales, it is primarily related to biological reproduction. A prominent human example is the simulation of animal calls for the hunt to attract the prey. The experience of successful acoustical interaction with animals, which certainly evolved long before the Neolithic revolution during the Upper Paleolithic era (40,000–10,000 BC) or even before, made evident that through sound imitation the external world can be influenced and, to a certain degree, controlled[3].

While the link between hunting and musical activities is demonstrated by the simulation of animal calls in hunting ceremonies[4], sympathetic patterns of vocal and instrumental imitation in traditional music are extended also to other acoustical phenomena of the natural environment, such as the atmospheric noise of the wind and the sounds of water in ceremonies dedicated to call the clouds and pray for rain.

2. IMITATIVE PROCESSES IN TRADITIONAL MUSIC: RECENT AND ANCIENT

In traditional music, imitative sounds are codified according to the autochthonous cultural conception and, in this context, have high symbolic value. To give a prominent example, among the Kaluli (Great Plateau of Papua New Guinea) vocal music is intimately associated with rainforest birds,

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1 Excerpt of Aztec song, palaeography and poetic translation by Brinton 1890.

2 On the linkage between evolution, imitative behaviour and social learning see Whiten/Ham 1992, Zentall 1996 and Blackmore 1998.

3 On the use of animal calls in Europe from paleolithic to modern times see Lund 1988, Dauvois 1994, Zeiler 1997 and Tamboer 2004.

4 See Merriam 1960, 66; Lawergren 1988.

reflecting the sounding environment in a powerful, very expressive way. In his study of the Kaluli women's funerary song weeping and men's ceremonial poetic songs, Steven Feld demonstrates that through the imitation of bird calls a process of identification and transformation takes place, as birds are considered to be spirits, speaking through the musician with the community[5]. Feld stated that "when Kaluli perform weeping or song, they become those very birds, and when others evaluate the moving nature of their performances, they compare the performers to them as well"[6]. According to the reciprocal understanding of the Kaluli, "spirit voices from talk to cries to song are reflected in bird sounds. [...] Ritual weeping and song recall and evoke the presence of spirits, and are understood as expressions of sadness embodied in being a bird. This sadness makes listeners cry like birds, completing a symbolic and emotional circle"[7].

A no less beautiful example from the American continent is the Snake Dance of the Hopi (Arizona, Southwest USA), which was characterized by Samuel Martí and Gertrude Prokosch Kurath as a circumferential ("peripheral") preservation of prehispanic music and dance traditions[8]. The annual ceremony was observed from the early 1880s and performed in the Pueblo of Walpi for the last time in its complete and public form in 1969[9]. At various stages of the ceremony imitative and associative processes are interwoven in musical practice.

Before the dancers of the snake society proceed with live rattlesnakes held between the lips, they perform a row dance with leg rattles made of turtle shells with toe bone pendants attached by leather straps. The rattles are played in a specific choreographical movement making the toe bones strike against the turtle shells at a high rate, according to Julian Scott causing "a noise not unlike the warning of the rattlesnake"[10]. The "measured and effective" simulation is performed by taking "a half step backward with the right foot, bringing the heel down with a quick movement"[11].

In this context, the leg rattles represent a means of acoustical identification with rattlesnakes. The underlying meaning is revealed by the Hopi conception of a kinship with snakes. Joann Kealiinohomoku[12] points out that, according to myth, a young Hopi man had a series of adventures and then entered the *kiva* (ceremonial chamber) of what turned out to be the snake *kiva*. There he met and married a beautiful woman, but the morning after their wedding she had turned into a snake and gave birth to hundreds of baby snakes. These snakes are, of course, relatives of the Hopi snake clan. As the Hopi rely on them as messengers to carry their prayers for rain to the underworld, where *Masaau*, the "Lord of Death" and the spirits of the ancestors live, the snakes have to be treated well, and so the ceremony honours, bathes, and "dances" the snakes[13]. According to Edward S. Curtis[14], a set of seven snake songs are sung to them "for their amusement". One of these songs, which was translated by Curtis[15], highlights that at the same time it is a prayer for rain:

> "Yonder in the west, at the house of the clouds, at Sípapuni, centre of the world, is a cloud-altar. Yonder up there, rain is rising. Thence goes the rain, those four younger sisters, the Rain-god Maids. Water-cougar is there with something on his face, a streak of rain-clouds. Water-light altar, moon-light water, that way it will be. Lightning, thunder, rain-rumbling-thunder! *Hiwaí*! Running water! *Hiwaí*! Running, running water! Yellow corn, Blue Corn, my Mother, will awaken us among the houses."

Indeed, as other Hopi ceremonies, the Snake Dance is a petition for rain and, unsurprisingly, the sounds of the wind, thunder and rain play a very important role. Thus, on the day the Snake Dance is held, the men of the antelope society sing for the snakes a low chant which, according to Scott, is "like the moaning of the wind before the storm"[16]. Simultaneously, hand rattles are played, "producing a pattering sound like that of falling rain"[17].

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5 Feld 1982, 85.
6 Feld 1994.
7 Feld 1994.
8 Martí/Prokosch-Kurath 1964, 153–159. Reminding one strongly of the Hopi snake dance are Aztec dances called "the swallowing of snakes" (*coatololiztli*) and "the swallowing of frogs" (*cueyatololiztli*), which were performed by a group of dancers holding live frogs and serpents in the mouth (see Sahagún 1997, 76). On the contemporary snake dance of the Maya-Quiché (Guatemala) see Termer 1976.
9 Since that time the Snake Dance is not given at all because there is no head snake chief, but some of the lesser chiefs hold a minimal and private ceremony in the *kiva* (Joann Kealiinohomoku, personal communication, December 2004).
10 See Farish 1918, 198.
11 See Farish 1918, 198.
12 Joann Kealiinohomoku (personal communication, December 2004).
13 According to Kealiinohomoku (personal communication, December 2004), the Hopi are the keepers of rain magic that they "discovered" by searching throughout the world after they made a covenant with *Masaau* to bring moisture to the world in exchange for being allowed to stay in this, the fourth world.
14 Curtis 1922, 138, 143.
15 Curtis 1922, 153.
16 See Farish 1918, 196.
17 See Farish 1918, 196. Scott describes the rattles as made of cottonwood instead of gourds, John G. Bourke as "T-shaped" (see Farish 1918, 196-197, 205). According to Kealiinohomoku (personal communication, December

After the song is performed, the men of the snake society proceed out of the *kiva* forming a row, led by their leader whirling a bull-roarer that produces "a noise like distant thunder"[18]. Then the men of the snake and the antelope societies form rows facing each other and, according to Curtis, "begin to sing in low tones, shaking their rattles gently; but gradually the volume of sound increases, in simulation of the approach of distant thunder"[19]. The simulation of the warning sound of rattlesnakes described above is followed immediately by the actual Snake Dance .

The acoustical anticipation of the objective, such as in the Snake Dance of the Hopi, is a frequently observed pattern of imitative processes in traditional music. Codified according to the autochthonous conception, these purposive acts give powerful emphasis to ceremonial activities. Comparable patterns are observed among numerous indigenous groups, showing that imitative processes often are a subject of collective performances, but also are individually performed, for instance, in the institutionalized form of expert musicians fulfilling the role of religious leaders. It is important to note that imitations are not limited to vocal intonation and instrumental playing, as similar processes are also manifested in choreographic patterns. This is not unsurprising, as both music and dance are frequently conceived as a unified whole.

3. AZTEC CEREMONIES

Unfortunately, the ethnohistorical record on comparable patterns in prehispanic music cultures is few and far between, but there is still sufficient information to suggest that they took an important part in the many music and dance traditions that flourished in Middle and South America between the third millennium BC and the sixteenth century AD. Detailed ethnohistorical information is present on the Aztec music culture (Basin of Mexico, Late Postclassic Mesoamerica, 1325–1521 AD), but there is also useful information on similar practices among other cultures[20].

A number of collective imitative processes in Aztec ceremonial music was compiled in the sixteenth century by the Franciscan missionary Fray Bernardino Sahagún, who referred to indigenous informants. He relates that chants performed in women's ceremonial row dances in the sacred temple precinct of Tenochtitlan simulated bird sounds. In a ceremony dedicated to the salt goddess *Huixtocihuatl*, whose likeness was among the dancers, all women carried flowers and "[...] went singing, crying out loudly, singing in a very high treble. As the *centzontli* bird takes [its song, so was] their song. Like a bell their voices [rang out]"[21]. Similar chants were performed by medicine women for the mother-goddess *Toci*: "they alone proceeded singing, apart, singing in a high falsetto; like [that of the *cen*]*tzontli* [bird] they raised their [voices in] song", while a ceremonial row dance called "hand-waving dance" (*nematlaxo*) around a temple was performed, in which all the dancers moved "like flowers"[22].

Chants imitating the calls of songbirds remind one strongly of Feld's description of the Kaluli song tradition, but there is insufficient information to suggest whether comparable associative elements were present or not. Thus, it is not related if the *centzontli* or *centzontlatolli* („the four hundred voiced", literally the "myriad-voiced"), which has been identified with the mocking bird (*Turdus polyglottus*), was connected to ancestral spirits. Nevertheless, the association of specific birds with supernatural beings was a common pattern in Mesoamerica. For instance, the Aztecs considered hummingbirds (*Trochilidae*) and butterflies (*Lepidopterae*) as the manifestations of the spirits of dead warriors and sacrificial victims, who lived for four years with the sun and then came back to earth to suck the flowers[23]. Members of the avifauna, in general, were considered to be manifestations of ancestral beings who survived the third world age[24].

The power of imitative processes in Aztec ceremonial music is demonstrated by chants "spreading a sound as of the crashing of waves"[25]. These chants were performed during an initiation rite called "the bringing out of the children" (*pilquixtiliztli*) and took place in a priestly courtyard every four years in the ceremony of *Itzcalli*, which was dedicated to the fire god *Ixcozauhqui* ("Yellow Face").

Sahagún also relates numerous ceremonial dances linked not only with the acoustical phe-

2004), the rattles are made from the scrotum of the antelope and sound like the rattling of the rattle snake. Bourke relates that they are filled with grains of corn and produce a "whirring sound resembling that of rain" (see Farish 1918, 204).

18 See Farish 1918, 197.

19 Curtis 1922, 149. Kealiinohomoku (personal communication, December 2004) confirms that the singing goes from very low volume that increases as the dance continues.

20 Without doubt, the question of imitative and associative processes applied to the instruments of South American music cultures would enrich the knowledge of the prehispanic musical thought considerably (see Hickmann 1990, 390–407).

21 Sahagún 1981, 88 (see also Sahagún 1997, 60).

22 Sahagún 1981, 115.

23 Sahagún 1952, 47–48. It should be pointed out that hummingbirds and butterflies are merely soundless animals.

24 Leyenda de los Soles 1975, 119.

25 Sahagún 1981, 157.

nomena of the natural environment but also with characteristic animal movements. To give an example, in courtyards of the temple precinct dances were performed, in which the participants formed a row and proceeded in meandering paths and spirals behind a leader, acting like individual sections of a whole[26]. The dance was called "to become snake-like coiled" (*coanecuilolo*), suggesting that the dancer's row was considered a single snake and that the performers collectively transformed into a snake-like being. Unfortunately, on the specific associations linked with these and other imitative processes in the Aztec music and dance culture not enough information is present. Thus, snakes were not exclusively associated with rain and fertility[27]. Thinking of *Xiuhcoatl*, the mythological "Fire Serpent", they could also be connected to the sun, sacrifice and war. Certainly, a complex musical universe stood behind these patterns, which is lost for ever. Individual imitations of animal movements are still a common pattern in contemporary traditions, such as in the Eagle Dance performed among North American ethnic groups[28].

4. MUSICAL INSTRUMENTS

It is not unsurprising, that a kaleidoscope of imitative and associative processes is reflected in the prehispanic instrumentary. Again, detailed ethnohistorical information is present on the Aztec music culture but, often enough, no interpretation can be carried out without paying attention to the archaeological context (if recorded) and the instrumental symbolism (if preserved). Another serious problem is that the original playing techniques are mostly lost. The common music archaeological issue can be demonstrated when imagining that Hopi leg rattles of a museum collection are studied without consideration of Scott's record referred to above: it would be improbable if not impossible to conclude that these instruments were used in a specific choreographic movement to imitate the warning sound of rattlesnakes.

In the following, a brief overview will be given, which shows the complexity of the prehispanic musical thought and the limits of music archaeological interpretation. Certainly, more information on the autochthonous association of instrumental sounds and their possible connotations is present than on their possible imitative nature.

GOURD RATTLES AND RATTLE STICKS

Aztec wooden rattle sticks called "instruments to strengthen the fog/cloud" (*ayauhchicahuaztli*) were used in priestly processions to bring rain to the fields[29]. In the *Quahuitl ehua* ceremony dedicated to the rain gods it is said that a priest "proceeded planting his rattle stick on the ground"[30], and a fertility dance of the *Tlacaxipehualiztli* ceremony performed with rattle sticks and gourd rattles (*ayacachtli*) called "the sowing of the rattles" (*ayacachpixollo*) was dedicated to shake the seeds in order to make them sprout[31]. Thus, it is likely that the sound of rattles was primarily associated with agricultural fecundity and, in specific rain ceremonies, was meant to simulate the sound of rain[32].

While only depictions of gourd rattles are preserved, fragments of at least three Aztec rattle sticks were excavated in offerings of the temple precinct of Tenochtitlan. In an offering of the Great Ballcourt the point of a large specimen was unearthed, which was painted in red[33]. Two smaller specimens painted in blue were excavated in offering 98 of the Great Temple[34] and offering X of the Precinct of the Eagle Warriors[35]. Additionally, in bench relief panels of the Precinct of the Eagle Warriors depictions of noble warriors in a solemn procession with large spears and rattle sticks are preserved. The archaeological information plus the rich iconographic record, which cannot be mentioned here in detail, indicate a use of rattle sticks in distinct ceremonial contexts and a rich repertoire of connotations.

CERAMIC RATTLES

Aztec ceramic rattles (*cacalachtli*) in the form of plates and vessels with rattling devices, globular

26 Martí/Prokosch-Kurath 1964, 149.

27 In the arid highlands of the Americas the conception primarily derived from the observation that the main activity and mating time of snakes is during the rainy period. Writing on the conception of the Hopi, Curtis (1922, 155) suggested that "the connection between serpents and rain is easily seen in the fact that [...] the symbol of lightning is a zigzag line, the conventionalized picture of a serpent. From the similarity between the sinuous gliding of a snake and the broken course of a lightning flash came naturally the concept of serpents as messengers of the rain deities."

28 Martí/Prokosch-Kurath 1964, 150–153.

29 Sahagún 1981, 99 (see Neumann 1979).

30 Sahagún 1981, 45.

31 Sahagún 1981, 55; Sahagún 1997, 57.

32 It should be noted that most of the original connotations are lost. To give a contemporary example of related meanings, the Maya-Lacandón (Selva Lacandona, Chiapas) consider gourd rattles to be female (the globular form has erotic connotations associated with breasts and hips) and their sound is meant "to please" the deities (Ochoa Cabrera/Cortés Hernández/Cortés Hernández 1998, 74).

33 López Arenas 2003, 128–130, Figs. 54–55.

34 Olmo Frese 1999, 209–212.

35 López Luján 2006 (in press).

hand rattles (predominantly in the form of gourds) and zoomorphic and anthropomorphic rattling figurines were of high importance in temple cult[36]. In the temple precincts of Tenochtitlan and neighbouring Tlatelolco, priests used large incense ladles (*tlemaitl*) with rattling handles in the form of snakes[37]. Most of these multifunctional instruments, which were designed to offer both the sweet scent of burning copal resin and musical sound, represent rattlesnakes, and it is likely that the sound was associated with their warning sound, specifically when played simultaneously. According to Sahagún, the instruments were raised towards the four world directions and shaken[38]. In the temple precinct of Tenochtitlan, mass offerings of rattling incense ladles were excavated around the Great Temple[39]. In the temple precinct of Tlatelolco, the instruments were offered in great number to the Temple of *Ehecatl*, the god of wind[40].

CONCH TINKLES AND METAL BELLS

Aztec row rattles composed of *Oliva* conches (*cuechtli*) or bells made of copper alloys (*tzitzilli*) or gold (*oyoalli*, *coyolli*) were primarily used by the representatives of deities; bells made of gold were also used by royal members and officials of high rank, as fine metallic sounds were associated with stately power[41]. Conch tinkles frequently took part of the ritual garment of goddesses related to the earth, fertility and the night. *Ilamatecuhtli*, the "Old Lady", a mother goddess associated with the Milky Way, wore a row rattle called the "star skirt" (*citlallin icue*): "This was bedight with small sea shells, on cured skin cut into long, thin strips, [with] shells set in the end of each [strip]. She wore it about her hips over [the other skirt]. When she walked, much did [the shells] jingle, the pleasant sound [carrying] far"[42]. The monumental statue of the mother goddess *Coatlicue* ("Serpent Skirt") depicts an elaborate skirt composed of interlaced rattlesnakes, conch pendants and metal bells. As revealed by the complex archaeological context of a large number of offerings of the temple precinct of Tenochtitlan, which cannot be referred to here in detail, row rattles made of conch tinkles and bells made of copper alloys were intimately associated with agricultural fecundity. Gold bells, on the other hand, were exclusively excavated in offerings of the Great Temple dedicated to *Huitzilopochtli* and *Coyolxauhqui*. These offerings were primarily associated with the sun, war, and sacrifice. Unfortunately, not enough information is present to suggest if possible imitative elements in music were present or not.

BONE RASPS AND TURTLE SHELLS

Aztec bone rasps made of human femurs (*omichicahuaztli*) and turtle shells (*ayotl*) struck with deer antlers were primarily used in funeral contexts and ceremonies dedicated to the afterlife. For instance, bone rasps, which were called "instruments for strengthening the bones", were played with a conch on a human skull resonator in order to help the deceased on their difficult journey into the underworld[43]. It can be suggested that the meaning of these and other instruments was influenced strongly by the provenance and the symbolism of the material of manufacture. Possibly, the hollow sound of bone rasps and the clacking sound of turtle shells evoked associations comparable with conceptions such as these of the teeth-chattering and bone-rattling skeletons of the medieval Dance of Death.

WOODEN AND CERAMIC DRUMS

Among the Aztecs, the sound of drums was associated with fire, the sun and royal power. Extant wooden drums, such as the famous tripod drum (*huehuetl*) of Malinalco, are ornamented with war imagery. It depicts dancing jaguars and eagles, sound scrolls in the form of the *atl-tlachinolli* ("burning water") sign for war, the *nahui ollin* ("four-movement") sign for the fifth world era and a representation of the god of music *Xochipilli* ("Flower Prince") in a bird costume. Aztec slit drums (*teponaztli*) show zoomorphic forms or depictions of *Macuilxochitl* ("Five Flower"), a god closely related to *Xochipilli*, while extant ceramic drums (*xochihuehuetl*) show the effigy of *Xochipilli* attached to the resonance body. Five ceramic drums were excavated in offering V dedicated to

36 See González Rul 1988, 124, Lám. 52; Guilliem Arroyo 1999, 161–163, 486–487, 489, 491–492, Lám 4 Foto 12, Foto 7, Lám. 3 Foto 3, Lám. 3 Foto 2, Lám. 2 Foto 6; Olmedo Vera 2002, 160, Foto 55.

37 See González Rul 1988, 74–81, 86–88, Lám. 24–27; López Luján 1993, 330; Guilliem Arroyo 1999, 155–158, Fotos 2–3; García Chávez/Hinojosa Hinojosa/Martínez Dávila 1999, 81, 84, Lám 6k. The material of the Great Temple is unpublished.

38 Sahagún 1981, 56.

39 López Luján 1993, 330.

40 Guilliem Arroyo 1999, 155–158, Fotos 2–3.

41 See Hosler 1994. The sound of *Oliva* shell pendants and metal bells, which is quite similar, is a fine and potent clicking at a high rate.

42 Sahagún 1981, 143.

43 See Seler 1898. In peyote ceremonies of the contemporary Tarahumara (Western Sierra Madre, Chihuahua), wooden rasps are played on the head of a sick person (see Deimel 2000).

the Great Ballcourt of Tenochtitlan[44], indicating a use in the music of the ritual ballgame, in which the rubber ball symbolized the sun. According to myth, drums were described as divine singers that originated from the court of the sun[45]. Comparing the mythological with the rich iconographic information, which cannot be mentioned in detail here, it is assumed that drum represented "vessels" in which the respective deities resided during the ritual, indicating that the musician underwent a process of transformation as a medium between the worlds[46]. In this context, a noteworthy organological element is that the sound holes of ceramic drums are so situated that the musical sound emanates behind the effigy[47].

SHELL TRUMPETS AND CERAMIC CYLINDRICAL TRUMPETS

Among the Aztecs, the powerful vibrating sound of shell trumpets (*tecciztli*, *quiquiztli*) was associated with the aquatic underworld, fertility and creation through sacrifice[48]. Its sound was regarded as the primordial blast of the world produced in the underworld by *Quetzalcoatl* ("Plumed Serpent") heralding the creation of humankind[49]. Sahagún relates, that the roar of the jaguar was compared with the shell trumpets' sound: "It growls, snarls, howls, roars like the blowing of trumpets"[50]. Indeed, the roar of felines can be simulated on shell trumpets by breathing and gurgling through the instrument[51], but it cannot be verified if this technique was applied or even known in prehispanic times. While shell trumpets were excavated in three offerings of the Great Temple (offerings 87, 88, and 7)[52], underlining their great importance as ceremonial signal instruments, only two possible fragments of ceramic cylindrical trumpets are preserved, which were unearthed in offering 78 of the Southern Red Temple, a small shrine situated south of the Great Temple[53].

CERAMIC FLUTES

Ceramic flutes, by far the most frequently unearthed and best conserved sound artefacts in the Americas, are good indicators of imitative and associative processes in prehispanic music. With the exception of the Aztec flower flutes discussed in a previous volume of the present series[54], less ethnohistorical information is present. From the ethnohistorical point of view, only some related terms, such as *huilacapitztli* ("dove flute") or *cuauhtlapitzalli* ("eagle flute"), indicate a possible imitation of the sounds of the natural environment. Additionally, the common music archaeological issue of having none or insufficient additional information on the original playing techniques has to be addressed. Thus, whistles and globular flutes in bird shapes may produce bird calls when applying specific playing techniques, but the same instruments may also produce non-imitative sounds[55].

On the other hand, some sound artefacts indicate that various playing techniques were applied on the same instrument. A prominent example is the Aztec eagle whistles, which, from the organological point of view, represent rare "trumpet-whistles" (Fig. 1)[56]. The instruments are composed of (a) a globular chamber with a trapezoid windway, (b) a short airduct and (c) a tube that encapsulates the airduct (Fig. 2). While the airduct represents a non-functional element , it is important to note that the attachment of a tube would not be necessary when using the instruments exclusively as simple whistles. Indeed, this or-

44 Castañeda/Mendoza 1933, 170–173, Fotos 67–68; Castillo Tejero/Solís Olguín 1975, 10-11, Lám. 3-4.

45 Ceballos Novelo 1956.

46 Both 2005a, 6270.

47 A comparable conception is revealed by the deified ceramic drums of the Maya-Lacandón, which exhibit sound holes behind the effigy of the deity *K'ayom* (Ochoa Cabrera/Cortés Hernández/Cortés Hernández 1998, 70), and the tripod drums of the Huichol (Western Sierra Madre, Nayarit und Jalisco) showing holes considered to be the mouth of the deity *T'epu* (Berrin 1978, 180–181).

48 See Both 2004, 264–265. This essay might be consulted to get an overview of the many associative elements of shell trumpets from the early Middle Preclassic to the Late Postclassic period of Mesoamerica (c. 1400 BC–1521 AD) and among contemporary indigenous groups.

49 Leyenda de los Soles 1975, 120 (see Johansson 1997).

50 Sahagún 1963, 2.

51 See Both 2004, 267.

52 Velázquez Castro 1999, 99, Foto 70; Both 2005b.

53 The material is unpublished. A photo of the broken point of a mouthpiece is published by Olmedo Vera (2002, 221, Foto 138 [upper row left]). The same offering contained figurative stone representations of cylindrical trumpets, which have been misinterpreted as "handles of feather fans" (Olmedo Vera 2002, 136–137, 219, 221, Fotos 32–33, 133 [upper row right], 137 [on the left]).

54 Both 2002.

55 Double whistles in the shape of frogs manufactured in the Classic Maya culture (see Velázquez Cabrera 2002) demonstrate the same problem. When applying a specific playing technique, which consists of pronouncing the so-called "uvula r" coarticulated with an "f", frog calls may be produced easily, but it is impossible to verify if this technique was known.

56 Both 2005b. The specific form of the beak has been identified with the characteristic form of the beak of an eagle (Olivera Carrasco 2002, 312, Fig. 1). Other iconographic elements, such as lateral pendants and a crest, identify the bird with the animal form of *Xochipilli*, the *quetzalcoxcoxtli*, which is identified with the pheasant (*Crax rubra*). It can be suggested that the instruments represent an eagle-pheasant hybrid and thus a very specific animal form of *Xochipilli*, but this difficult topic is a matter for further discussion.

ganological element demonstrates that the eagle whistles were designed for distinct playing techniques. When played with a short blow calls of a bird of prey can easily be reproduced[57], even a kind of echo by exhaling and gently pushing the remaining air out of the tube. When applying the lip-vibrating technique, the whistles emit a distorted (non-lineal), buzzing noise without any equivalent in the sounding environment. By controlling the lip vibration, also different pitches can be modulated. In this case, the instruments function as trumpets with the peculiarity of an integrated whistle as sound modifier.

Unfortunately, on the association of the distorted sound not enough information is present. Hernando de Alvarado Tezozómoc related a funeral ceremony dedicated for the dead warriors of a lost battle, in which the priests played "hoarse flutes" (Span. "*flautas roncas*") together with bone rasps and gourd rattles[58]. According to Tezozómoc, these flutes were called "eagle flutes" (*cuauhtlapitzalli*), and if these were the eagle whistles, the distorted sound was possibly perceived as an expression of sadness[59], but this cannot be verified with absolute certainty.

Wind instruments exclusively producing imitative sounds, which were frequently produced in Mesoamerica, are so-called "whirlwind whistles"[60]. Their elaborate acoustical mechanism, which principally consists of (a) a tubular airduct with a constricted passage, (b) a counterpressure chamber and (c) a collision chamber (Fig. 4), produces a distorted sound reminding of the atmospheric noise generated by the wind[61]. By applying different air-pressures, the characteristic sound can be modulated. When played softly, the instruments generate a raspy noise. Played with maximum air-pressure, a sound reminiscent of an aggressively howling wind can be produced. Without doubt, these instruments represent unique sound artefacts, demonstrating that the effect of the noise of the wind was intensively studied and reproduced.

Instruments belonging to this group are Aztec skull whistles (Fig. 3), whose form makes an association with *Mictlantecuhtli* evident, the "Lord of the Underworld". On the other hand, the sound characteristics reveal an association with the wind god *Ehecatl*, a manifestation of *Quetzalcoatl*. Indeed, in a famous depiction of the Codex Borgia the god of the underworld and *Ehecatl* are shown as counterparts forming a unified whole (Fig. 5). The depiction has been interpreted to represent the duality of life and dead[62], which could also represent the underlying meaning of the skull whistles. Moreover, it has been suggested that the image depicts *Yohualli Ehecatl* ("Night-Wind"), a deity venerated by the merchants[63].

Ethnohistorical data is considerably helpful to deepen the possible semantics of these sound artefacts. According to the Aztec conception, the fifth level of the underworld was filled with the personified "obsidian wind" *(iztli ehecatl*), a sharp wind carrying along obsidian blades[64]. The sphere, which was called the "place of obsidian wind" (*iztehecayan*), had to be passed on the four-year journey of the deceased and one "underwent much pain and suffered much", if one could not shield oneself with the clothes and personal effects burned by the bereaved[65]. On the terrestrial level, the obsidian-bladed wind had its equivalent in the infernal "wind of the land of the dead" (*mictlampa ehecatl*), the deadly cold wind blowing from the northern plains during the peak of the winter period (December and January). In these winds, the destructive aspect as the Aztec god of the wind is manifested, who in this particular form is clearly coalescing with *Mictlantecuhtli*.

It would not be unsurprising if the sound of the skull whistles was meant to simulate the nightly winds of the underworld. Indeed, the assumption is supported by archaeological data, as two skull whistles were unearthed in a burial dedicated to the Temple of *Ehecatl-Quetzalcoatl* of the temple precinct of Tlatelolco[66]. The burial contained a sacrificial victim holding a whistle in each of his hands (Fig. 6). Among the objects associated with the victim were obsidian blades (!) and a rattling incense ladle, which possibly was meant to provide some light and warmth in the underworld. Closely associated was a second human sacrificial victim, who was buried in a similar position along with the attributes of *Ehecatl*. In this context, the pictographic representation of the Codex Borgia has to be recalled, indicating that the victims possibly represented *Yohualli Ehecatl*.

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57 Although the instruments demonstrate iconographic elements of the *quetzalcoxcoxtli*, the pheasants' caw cannot be imitated.

58 Tezozómoc 1994, 17.

59 On the conception of "weeping" instruments in prehispanic South America see Koch/Mendívil, this volume.

60 Prehispanic noise generators made of different materials such as bone, stone and ceramics with simple perforations, which can be considered as archetypes of the Aztec skull whistles, are described by Martí 1968, 156–161; Franco 1971, 20; Schöndube 1986, 91–92, Fotos 1–2; Contreras Arias 1988, 61–62; Rawcliffe 1992, 52–58, Figs. 11–18; Rawcliffe 2002, 259–260, Figs. 14–15 and Velázquez, this volume.

61 The understanding of the acoustical mechanism is subject of an ongoing discussion.

62 Seler 1906, 168–169.

63 Seler 1906, 168–169.

64 Sahagún 1952, 41 (see López-Austin 1980, vol. I, 61–63, 380–381).

65 Sahagún 1952, 41.

66 Guilliem Arroyo 1999, 117–118, 165, Foto 44, Lám. 2 Foto 3.

Unfortunately, not enough information is present to suggest if one or both victims played the skull whistles before the ritual sacrifice or not. Sahagún related, that the sacrificial victims of the merchants were encircled four times during the ritual purification with a whistle called *chichtli*, which produced a "*chich*"[67], but the identification of this instrument with the skull whistles cannot be verified with absolute certainty, as Sahagún does not provide a description of its form or symbolism. Nevertheless, the onomatopoetic expression of its characteristic sound can be linked with the sound of the skull whistles. It also cannot be excluded that specific instruments were used in distinct contexts.

Many other wind instruments deserve discussion with respect to imitation and association in prehispanic music, such as the serpent flutes or the many effigy flutes manufactured throughout Mesoamerica, but this essay is meant to provide just a brief overview. Nevertheless, enough information is present to come to the conclusion that imitative and associative processes took part in a multifaceted musical universe deeply interwoven with prehispanic worldviews.

[67] Sahagún 1959, 63–64.

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Fig. 1 Aztec eagle whistle. Height 10.4 cm. Offering 3 CÁ, Great Ballcourt of Tenochtitlan. Museo de Sitio del Templo Mayor, No. Inv. 10-265346. Drawing by Carolina Hohmann.

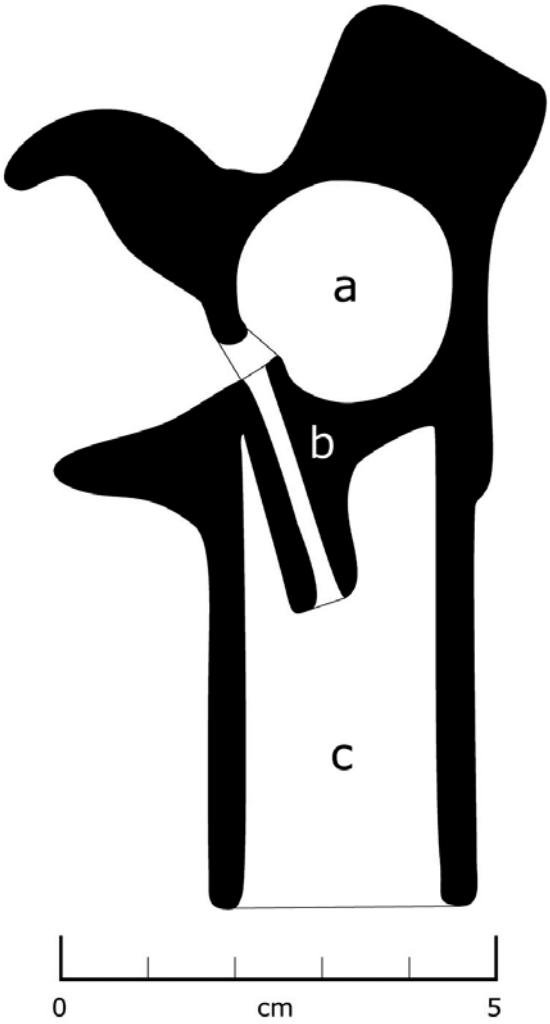

Fig. 2 Section of Aztec eagle whistle. Drawing by Cindy Koch.

Fig. 3 Aztec skull whistle (fragment). Height 3.5 cm. Staatliche Museen zu Berlin - Preußischer Kulturbesitz, Ethnologisches Museum, No. Inv. IV Ca 2621m. Foto by Claudia Obrocki.

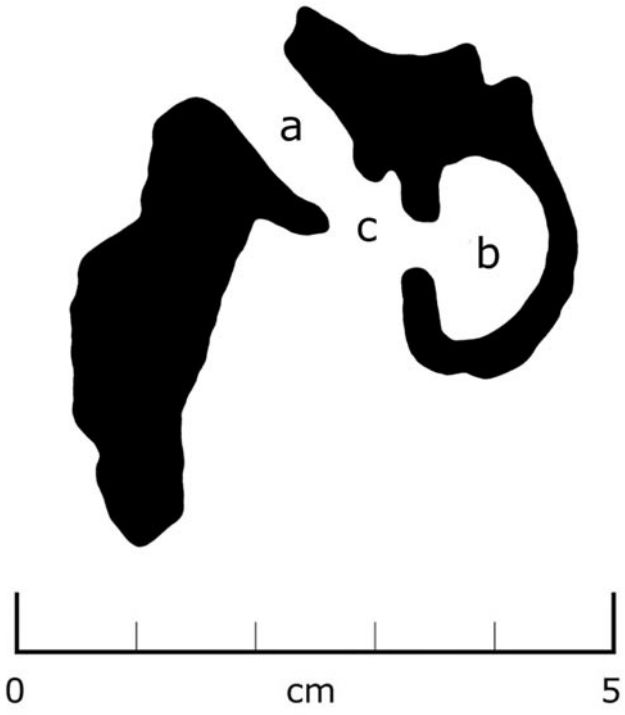

Fig. 4 Section of Aztec skull whistle. Drawing by Arnd Adje Both.

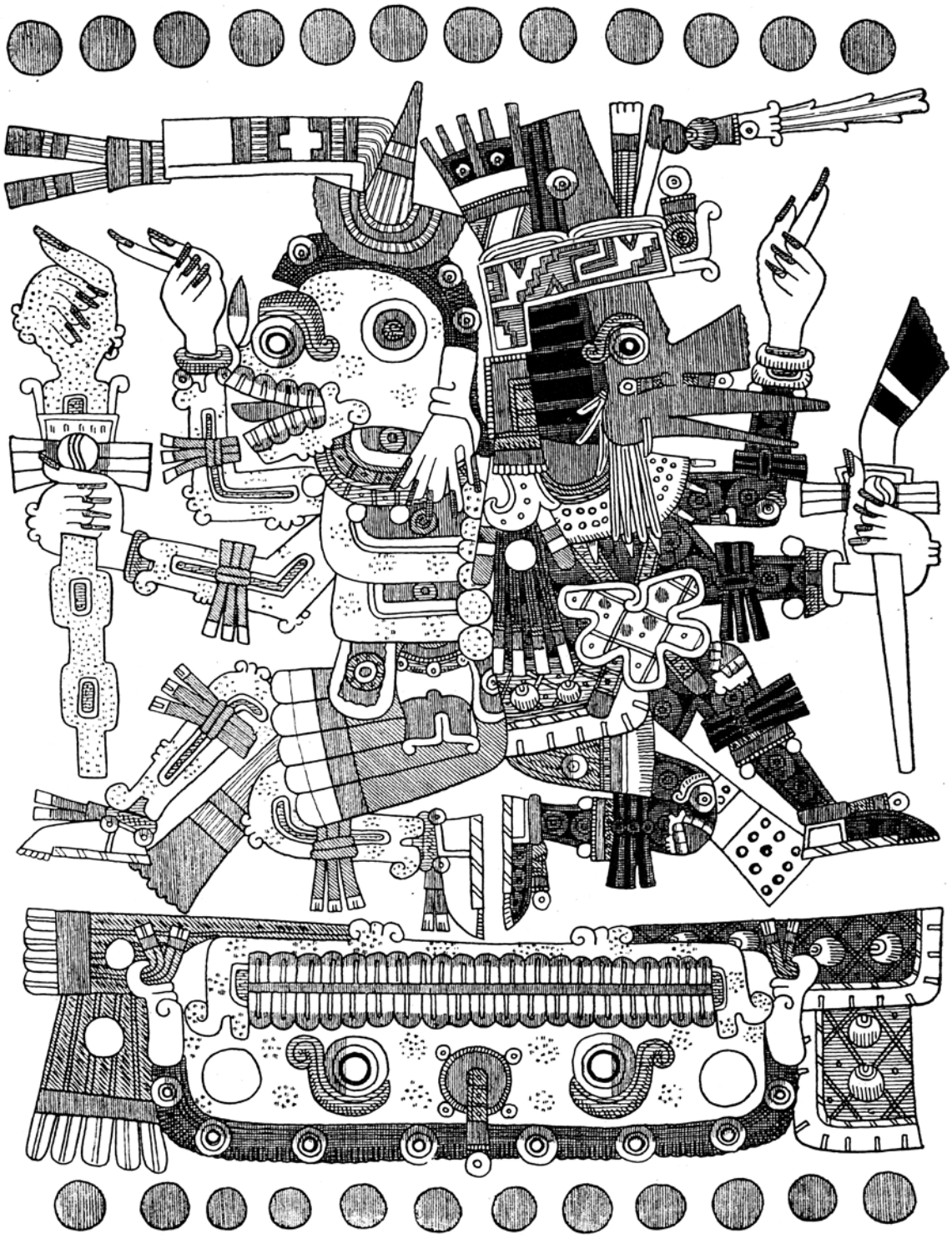

Fig. 5 *Yohualli Ehecatl*. Codex Borgia, fol. 56 (section). After Seler 1906, Tafel 56.

Fig. 6 Burial 20, Temple of *Ehecatl-Quetzalcoatl*, Tlatelolco. Photograph by Salvador Guilliem Arroyo. Proyecto Tlatelolco 1987– 2006. INAH México.