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Soundscapes of the Everyday in Ancient Oaxaca, Mexico

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ABSTRACT

In ancient Mexico, sensory engagement in the form of oratory, music, and performance were major components of state-sponsored festivals and noble feasts. We think far less, however, about the soundscapes associated with rituals and everyday life in household contexts. Drawing on contextual, iconographic, and acoustic analyses of flutes, whistles, bells, costume ornaments, and ceramic vessels with rattle supports from the site of Río Viejo in coastal Oaxaca, Mexico, we argue that sound-production created a shared spatial landscape that linked community members to one another. Even in the absence of visibility or participation, soundscapes were prominent, celebrated elements of everyday life that purposely blurred the boundaries between the natural, cultural, and spirit worlds

Résumé: Dans l'ancien Mexique, l'engagement sensoriel sous la forme de l'art oratoire, de la musique, et des spectacles a été l'un des éléments majeurs des festivals et des fêtes nobles parrainés par l'État. Nous pensons beaucoup moins, cependant, aux milieux sonores liés aux rituels et à la vie quotidienne dans les contextes domestiques. S'appuyant sur les analyses contextuelles, iconographiques, et acoustiques des flûtes, des sifflets, des cloches, des ornements des costumes, et des récipients en céramique avec des supports pour crécelle du site de Río Viejo sur la côte de l'Oaxaca, au Mexique, nous montrons que la production sonore a créé un paysage

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spatial partagé qui rassemblait les membres de la collectivité. Même en l'absence de visibilité ou de participation, les milieux sonores ont été des éléments célèbres importants de la vie quotidienne, qui ont volontairement brouillé les frontières entre le monde naturel, culturel et spirituel.

Resumen: En el México Antiguo, la vinculación sensorial a través de la poesía, la música y la representación solían ser los mejores componentes en los festivales y banquetes de los nobles patrocinados por el estado. Sin embargo, se ha considerado en menor importancia a los sonidos asociados con rituales y a la vida cotidiana en contextos domésticos. A partir del análisis contextual, iconográfico y acústico de las flautas, silbatos, cascabeles, adornos de vestuario, y vasijas de cerámica trípodes con sonajas procedentes del sitio de Río Viejo en la costa de Oaxaca, México, argumentamos que la producción sonora servía para crear un ambiente espacial compartido que unía a los miembros de una comunidad. Incluso ante la ausencia de visibilidad o de participación, los sonidos eran considerados importantes y parte integral de la vida cotidiana y que de manera intencionada borraban las fronteras entre el mundo natural, cultural y espiritual.

KEY WORDS

Sound, Music, Senses, Acoustic analysis, Household archaeology, Mesoamerica

Introduction

In ancient Mexico, sound, speech, and song were important and sacred parts of state ritual. These spectacular events provided a space and place for embodied engagement by the principal actors and audience members alike, all of whom had particular social, political and economic roles in the performance. Participants experienced a ''total sensory assault,'' filled with smells, sounds, colors, tastes, and movements, all of which served to heighten and challenge each individual's sense of self and create a sense of history and belonging. Oratory performed by leaders and dignitaries during state festivals was described as ''flower-song'' and was equated with wisdom, godliness, solar power, and the heat that was emitted from the speaker's body as if it was communicated directly from the sacred world (Houston et al. 2006:276; Léon-Portilla 1963:75). Likewise, dancers who took part in rituals and state festivals and the musicians who accompanied them were described in Nahuatl (Aztec language) as ''singing'' with their feet or ''singing'' through their instruments (Both 2007:94; Stanford 1966:103).

We think far less, however, about the sensory aspect of rituals and activities in everyday household contexts. We argue here that the sensory aspects of activities in everyday contexts were just as important or as much "felt" as those in elite or state contexts. The very beauty of Mesoamerican belief systems is that they reproduce an underlying isomorphism inherent in long-standing Mesoamerican cosmology and metaphysics between things in the everyday world and things in the sacred world. Commonly used Mesoamerican resources, goods, and foodstuffs, including maize, gemstones, feathers, shells, trees, snakes, birds, mountains, caves, water, rain, thunder, and lightning were all considered animate and divine. Thus, the actions of people in everyday contexts where these materials were used or experienced automatically and simultaneously invoked the same sacred forces as those celebrated in elite rituals. Such actions include planting, tending, and harvesting corn, sorting beans, preparing food, using stone tools, building houses, weaving textiles, and traveling to nearby communities and sacred places. Activities and rituals in non-elite contexts, like state rituals, were important for enacting connections between people, ancestors, gods, and life-giving forces in the sacred world. The sounds of bells, rattles, and whistles, much like the habitual motions of grinding corn, the visual impact of embellished clothing, and the fragrance of food and flowers, referenced and engaged the same deeply meaningful symbolism and vitality.

This paper explores the meaning, depositional contexts, and symbolism of sound-producing objects in a non-elite Mesoamerican village to better understand the soundscape of everyday contexts. The site of Río Viejo in coastal Oaxaca, Mexico provides excellent data for examining the intentional sensory aspects of rituals and everyday practices in household settings (Fig. 1). Household excavations uncovered large numbers of objects related to sound-making, including bells, rattles, flutes, and whistles distributed in and around a neighborhood of seven or more houses dating to the Early Postclassic period (A.D. 975–1220, calibrated AMS date) (King 2003). In addition, nearly all of the colorful tripod ceramic serving vessels used for everyday meals and placed as burial offerings were embellished with rattle supports. Sound-making objects were found in various contexts within the neighborhood, including middens, interior and exterior occupation surfaces, construction fill, and burials, requiring broad interpretations about the meaning of sound in everyday contexts. Acoustic analysis of the whistles and flutes shows that some sounds traveled beyond the immediate household, reaching people in other neighborhoods. The sounds of bells and rattles would have been heard well in more intimate settings connecting smaller groups of people. The range at which sounds could be heard created a spatialized auditory landscape, or soundscape, within which everyday activities were mapped. In the non-elite Mesoamerican

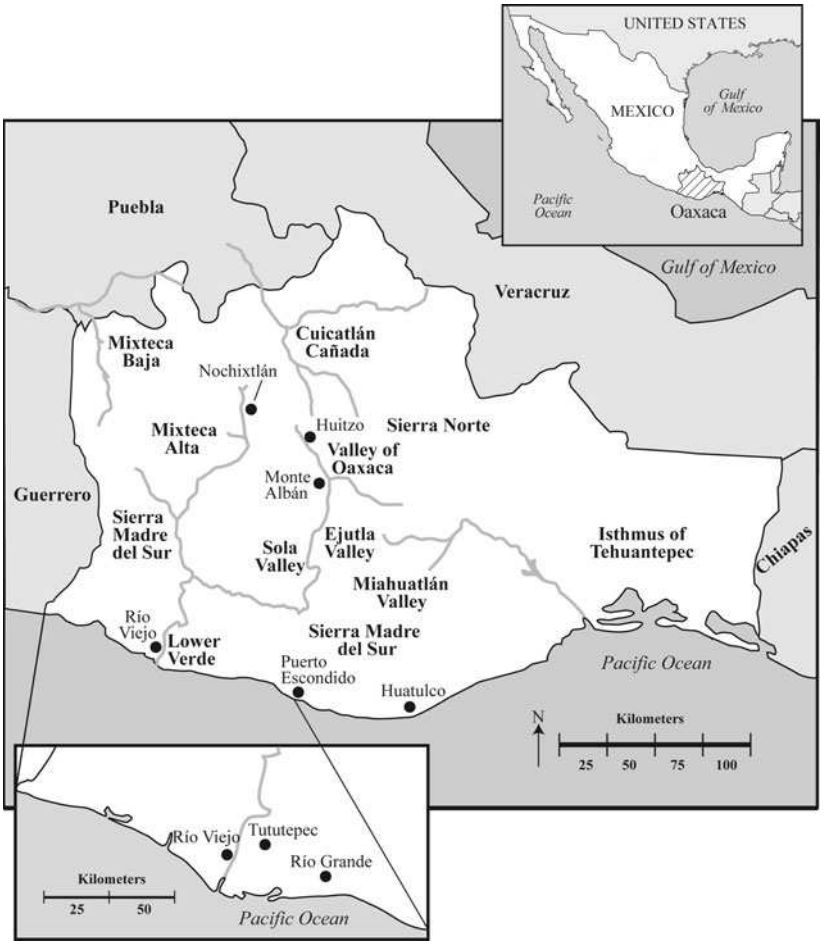

Figure 1. Map of Oaxaca, showing the location of Rio Viejo and other sites and regions mentioned in the text

soundscape, public and private space overlapped, creating a stronger neighborhood-level social and political community.

Sound and Sound-Production in Mesoamerica

In Mesoamerican cosmology, the sacred world was a beautiful, fragrant enchanted watery garden filled with gods and ancestors in the guise of flowers, birds, and colorful gemstones who were the sources of procreative and transformative power (Burkhard 1992; Hill 1992). Ancestors inhabited

this world as birds and butterflies and helped to supply the warmth and life-force to newborns and maize. Royal song in ritual enchanted and filled listeners' ears with sacred beauty, communicating information, emitting life-force and reproducing being in a context that marked it as divine (Bierhorst 1985). This is beautifully expressed in Nahuatl poetry recorded by Sahagún, in which oratory is described with the dramatic couplet "*in xochitl, in cuicatl*" (flowery-song) (Léon-Portilla 1963:75). Flowery-song is carefully illustrated in Mesoamerican iconography and in Mexican codices (painted picture books) as speech scrolls—volutes emerging from a speaker's mouth—sometimes filled with precious items (shells, flowers, gemstones, such as in the mural art of Teotihuacán) denoting a certain quality of speech (Houston et al. 2006:275). It also beautifully expressed in the titles and lyrics contained within 16th Century Aztec songs, such as those recorded in *Cantares Mexicanos* (Bierhorst 1985).

During Aztec rituals, participants experienced what Clendinnen (1991:258) describes as a "great sensory assault" where the senses of taste, sight, hearing, smell, and touch were relentlessly engaged and dramatically provoked. Aztec rituals were frequent and enacted at a massive scale, often lasting for several days. They involved many participants of various social classes with numerous different roles—as priests, dancers, musicians, actors, suppliers of food and drink, craft producers, or sacrificial victims. The sensory experience of these rituals was often heightened by the use of hallucinogenic substances and deprivation or fasting in the days leading up to the start of the ritual. Rituals instilled a sense of history, belonging, and community in a public context where social difference in everyday life reigned supreme. Sensory experience thus challenged one's sense of self and kept people coming back for more, whether by choice, curiosity, or obligation. Most importantly, it was through sensory experience that people connected to the divine, communicating with the ancestors and gods who helped to keep the world in balance.

In Postclassic Oaxaca, ritual and performance in noble class politics were equally embodied and sensuous. Most of our knowledge of elite ritual in Oaxaca is derived from close readings of Mixtec codices and ceramic iconography. These images record stories relating to ancestors, historical-supernatural events, and origins, and include numerous depictions of feasts and rituals (Boone 2000:241–242; King 1994). Noble feasts provided a communal space for ritual performance connected with the renewal political alliances and the reaffirmation of genealogical connections (Pohl 1994). Codices and boldly-decorated serving dishes (Lind 1987) served as material propaganda at such events. Codices were not simply two-dimensional books available to a few, but likely would have been hung three-dimensionally during feasts and political events and their stories would have been performed by actors on temple stages, such that the text cannot be

separated from its performance (quite literally, its "singing") (King 1994:127; Monaghan 1994:89). This is why many specialists argue that the codices are best understood through an aural reading of the images. Like Aztec ritual, the senses of all participants (actors and viewers alike) in Mixtec noble feasts were engaged through dance, elaborate costumes, oratory, instrumental music, song, food, drink, and burning of incense.

Sound is not devoid of other sensory components—speech is heard, breath and wind is fragrant or odorous (whether or not it is emanating from the body), and at some frequencies, sounds can be felt (Bruchez 2007:49). In Mesoamerica, the senses of sound, sight, and hearing were conceptually and synaesthetically linked, where each sense releases another (Houston and Taube 2000:289). Indeed, visual images in the form of iconography, stone carvings, mural painting, and books express multi-sensory components in very stylized ways. Flowers and swirls denote smells, but were also drawn so that they would appear to breathe, speak, sing, move, and dance. Others markings denote sound qualities or properties such as echoes, rumbling, volume, and sharpness (Houston et al. 2006:274; Scarre 2006:3–4). Likewise, the sinuous relief of carved stone surfaces and depictions of fibers, mud, and water in two-dimensional iconography reference tactility in much the same way that polished stone references light and reflectivity.

Sound and sensory engagement were not only important during state festivals and noble feasts. The everyday world that ancient Mesoamericans inhabited was also a world filled with sensory stimuli, both intentional and unintentional. Revered community members and family elders spoke using formal speech, dancers and musicians sang as they performed, water roared as rivers gushed downstream, pots of stew gurgled as they bubbled on the hearth, palm-thatched rooftops rustled as winds blew, digging sticks rhythmically pounded the ground as fields were prepared for planting, and beans rattled as family members prepared the daily meal. Most archaeological objects that we commonly find in residential areas would have produced sound while in use, such as obsidian, metals, spindle whorls, grinding stones, and burnishers. For many of these, sensory characteristics were likely an important part of the selection of raw material and method of manufacture. Clays, metals, and precious stones were often selected for their specific sound- and color-producing qualities (Hosler 1994; see Jones 2004:335). Copper–gold alloys, for example, were specifically created for adornments that had desired sound and color qualities (Hosler 1994; Saunders 1998), much to the consternation of the Spanish who wanted "pure" gold in nice, flat sheets (Saunders 1999:253). Mesoamerican clothing was made out of fibers in varying textures and weaves and was embellished with sound-producing ornaments such as beads, pendants, jewelry, and bells (Berdan 1987; Hosler 1994). The addition of tropical bird feathers on

headdresses and textiles added a desirable brilliance, sheen, texture, color, and sound to clothing (Houston et al. 2006). In other cases, the formal design references sensory qualities. Earflares and nose ornaments, for example, were often decorated with petal images evoking the fragrance of flowers and hearing and breath/smell of ancestors (Houston et al. 2006:143). Aztec flower flutes, with their distinct petal design, purposely conjured up the image that flowery song emitted the scents of blossoms (Both 2002:281). Songs and speech were considered flowers for the ear, which were valued for their beauty, becoming metaphors for landscapes (Hill 1992:120). On ceramic vessels, solar, bird, flower petal, feather, and zoomorphic designs referenced the sensorium of the sacred flower-world. Rattle supports on ceramic vessels used sounds to reference the same things.

The many objects in the Mesoamerican repertoire whose intended purpose was sound production simultaneously integrated multiple senses, including hearing, touch, and smell/wind/breath. The corpus of musical instruments depicted in Mesoamerican artwork and documents is large and varied (Both 2007; Martí 1968). The instruments typically include percussion instruments (idiophones and membranophones) that are struck or shaken such as turtle shells, scrapers, rattles and drums, and wind instruments (aerophones) that are blown, including tubular and globular flutes (Both 2007; Godínez Orantes 2003; Martí 1968). Among the latter are whistles or *silbatos*—globular flutes without a finger hole, and *ocarinas*—globular flutes with one or more finger holes, and trumpets. In the Aztec world, certain instruments were restricted to particular ceremonies, particular noble or priestly musicians, or particular contexts (temples, palaces, shrines) (Both 2007). Often the purpose of these rituals was to invoke the ancestors or call up spirit guides (nahuales), and they were thus associated with transformation (Vogt 1977). Based on text descriptions of some of these events, each used particular rhythms and combinations of instruments, making the event sorrowful, reverent, or joyful. Sometimes songs were played in particular processional formations and musicians would play their instruments towards particular directions to reference (and recreate) a spatialized configuration of the cosmos (Both 2002:281). Drumbeats, chanting, pulses, and vibrations were used to create bodily (somatic) effects and to enhance the trance state and sensory experience (Hume 2007:55, 59).

Although we do not necessarily know the structure of ancient Mesoamerican music, we are beginning to understand how and why particular kinds of musical instruments were made and in what contexts they may have been used (Both 2009:5). In most cases, this has been accomplished through the detailed study of iconography and ethnohistoric texts, such as the landmark study by Martí (1968). More recently, Both (2007) uses Aztec iconography, text, and archaeological evidence to compare two locations in

which different protocols and instruments were likely used: temples and royal courts. This study compares the ostensible division between sacred and political contexts of music production and provides evidence that, for example, some temple rooms were used for musical instrument storage. Based on Maya iconography, Sánchez (2007) outlines different contexts and events during which musical processions took place and provides some evidentiary support that drums may have been used in processions along Maya causeways (citing an unpublished conference paper by Keller 1996). Barber et al. (2009) link an exceptionally carved bone flute to the occupant of the grave in which it was buried and suggest that the buried deceased male was a revered high-status musician. Stöckli (2007) connects musical instruments at the Maya center of Aguateca in Guatemala with primarily elite residential contexts, and perhaps with women based on linkages with artifacts typically associated with women (spindle whorls, figurines). Here he finds that music production is relatively decentralized among houses, with no particular family or specialist in charge. Sánchez Santiago (2005) completed the first study of aerophones in ancient Oaxaca that brings together context, acoustics, and organology. He notes that aerophones have been found in a variety of primary and secondary archaeological contexts in Oaxaca, including burials, fill, and residential middens, and argues that they were primarily used to invoke the spirits of ancestors (Sánchez Santiago 2005:68). In many other studies, sound-producing artifacts are mentioned or described, especially in reports on figurines, but sound and soundscapes are not the primary focus of discussion or interpretation.

Sound-Making and Instruments at Río Viejo

Río Viejo during the Early Postclassic was much changed from what it had been during earlier centuries. Rather than a regional center at the head of a 5-tier state-level political hierarchy with monumental architecture and elite, named rulers depicted in carved stone stelae (Joyce et al. 2001; Urcid and Joyce 2001), during the Early Postclassic, the population was less politically stratified and reduced in number. The region as a whole had undergone a major political transformation resulting in the cessation of the construction of monumental, ceremonial architecture at political centers and elite politico-religious ideologies as dominant forces in everyday experience. Instead, Early Postclassic residents of Río Viejo lived on top of the remains of old monumental architecture, building new modest houses, tightly clustered into a few neighborhoods (Fig. 2). They buried their dead beneath their house floors in highly standardized mortuary ritual that connected living house members with their deceased adult ancestors (King 2006, 2011a). They had an egalitarian, subsistence based economy, without

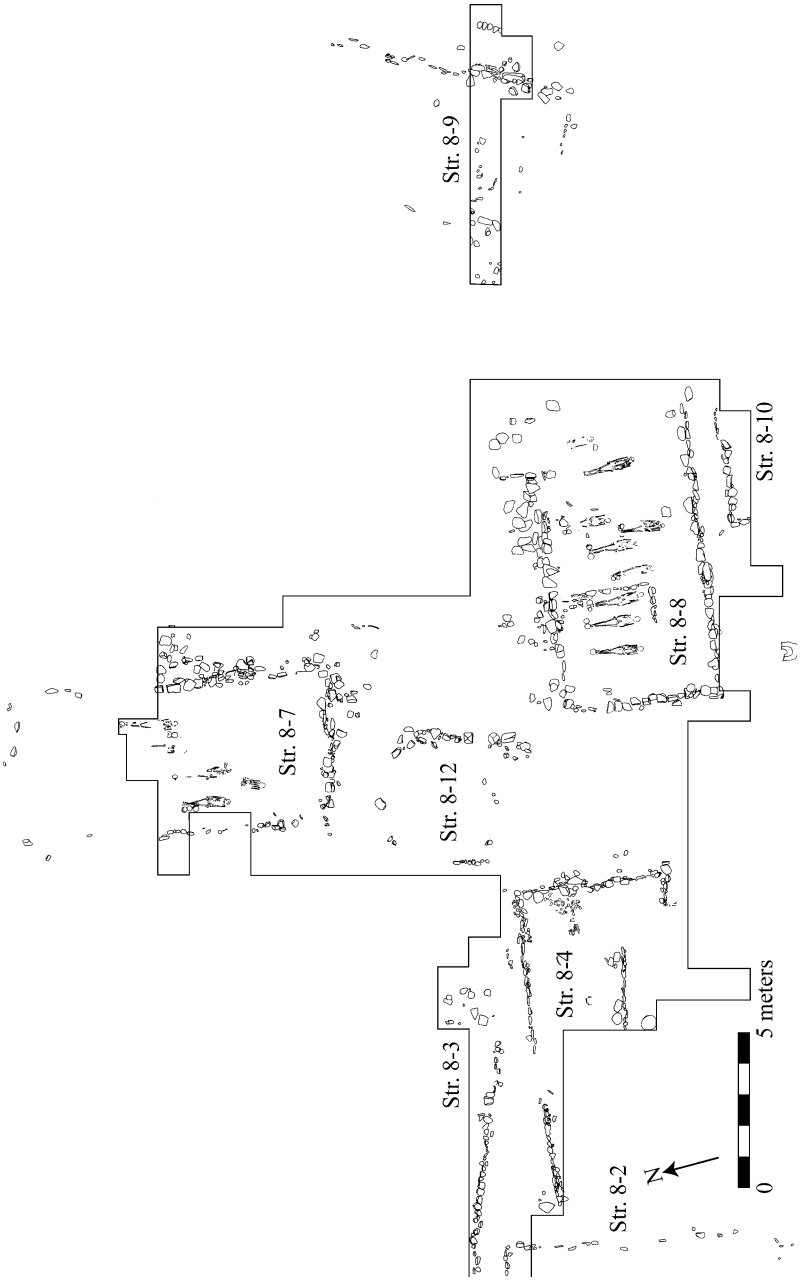

Figure 2. Plan view of the neighborhood and excavation boundaries at Río Viejo

a clear overarching political hierarchy (King 2003). Nonetheless, residents maintained interregional ties to traders and peoples in far-away regions and had access to widely circulated Mesoamerican resources, ideas, and artifacts (King 2008a). Río Viejo's primary interregional ties were with highland communities in the mountains to the north rather than communities along the Pacific coastal plain. Their cotton-thread industry ensured continued access to imports, especially obsidian from highland Mexico (King 2011b). Despite their distant location, Río Viejo residents maintained a relatively high standard of living. As in earlier centuries, the residents of Early Postclassic Río Viejo were probably Chatino-speakers whose primary contacts were with Mixtec-speaking communities living in the highlands in western Oaxaca (King 2008a). Through the Mixteca, they were connected to the urban centers of Cholula and Tula and the macro-regional Early Postclassic world.

The corpus of sound-producing artifacts found at Río Viejo is varied and large. Although it is not uncommon to find sound-producing artifacts in domestic assemblages in Mesoamerican archaeological sites, they are rarely addressed in a substantive manner in archaeological analyses and interpretations. Researchers almost always focus on visual and formal typologies and/or the representational (symbolic) content of artifacts rather than sound, reinforcing a Western sensorium that privileges the visual (Watson 2006:15–16). In the following sections, we discuss the different kinds of sound-producing artifacts found at Río Viejo, including whistles, figurines, flutes, bells, and ceramic vessels. We place the artifacts in their archaeological contexts of discovery, use, and discard, and raise important questions related to their interpretation. We close the text with a discussion of non-elite, everyday soundscapes that takes into account the entire corpus of sound-producing artifacts. Last, but certainly not least, Electronic supplementary material 1 includes a detailed catalogue of these artifacts focusing on instrument organology. It includes descriptions, measurements, photographs, and *.mp3 files that highlight the range and diversity of sounds that they are capable of making.

Whistling Figurines and Flutes

Diverse flute types, including whistling figurines, are grouped together in this section because they are categories that emically overlap; in many cases, figurines were constructed so that they were also whistles, whistles are modeled with anthropomorphic and zoomorphic effigies, and tubular flutes with finger holes will have molded anthropomorphic appliqués. Río Viejo's ceramic figurine sample includes nearly 500 fragments found in

Early Postclassic depositional contexts. Most were found discarded and broken on occupation surfaces, architectural fill, and middens rather than being carefully curated within primary deposits. Anthropomorphic figures comprise 86.4% ($n = 427$) of the assemblage and zoomorphic figures are represented in the remaining 13.6% ($n = 67$). While pastes vary (between oranges and grays with varying tempers), the majority of the anthropomorphic figurines represent women wearing skirts, blouses, jewelry, and headdresses often elaborated with beads, feathers, intricate hair designs, and representations of birds (including turkeys and eagles) (Fig. 3). Among the animal figurines, most represent birds, especially turkeys.

In six clear cases, slab figurines representing barefoot women wearing long skirts have mouthpieces on the reverse side that both make the figurines whistle and simultaneously serve as supports for standing the figurines upright (Fig. 4). While the clothing is depicted as smooth cloth, many of the examples include rows of tassels or beads hanging from the waist or neckline. In most cases, the upper part of the figure is broken, either from the waist or neck up. Judging by the clothing represented on the few intact pieces and the many disembodied heads in the assemblage, it is likely that these figures had highly elaborated hairstyles and headdresses. In a few cases, the women carried children in their arms. The figurine bodies and costume detail were made with molds, while the resonating chambers were hand-modeled and the mouthpieces were appliquéd and smoothed onto the back. Among the pieces coded specifically as musical instruments (whistles and tubular flutes), 50% ($n = 44$) represent human figures and 7.7% ($n = 7$) represent animals, including many examples of birds. Tube shafts, most likely associated with whistles and tubular flutes, comprise the final 42.3% of the whistle/musical instrument collection ($n = 37$) (Fig. 5).

Acoustic analysis shows that slab figurines/whistles produce an especially high-pitched and shrill sound (between 834 and 2852 Hz), which most likely would have been used in open spaces or to communicate across longer distances (see Electronic supplementary material 1). The sound in these pieces travels at least 350 m or more, making them ideal for signaling or calling people in other neighborhoods, rather than for use in small house-specific rituals or child's play. When not in use, these figurines were likely placed on display on a shelf or an altar, using the support to stand them up. Depending on the head position and movements of the person who blew the whistle, the figure would have been visibly standing upright or facing down looking at the ground, and could have been made to appear to dance, sing, and expel breath.

It is also important to think about the representational content of the figurine/whistles. Who is this woman or these women depicted in the figurines? Why does she, in particular, produce sound? Most of the figurines

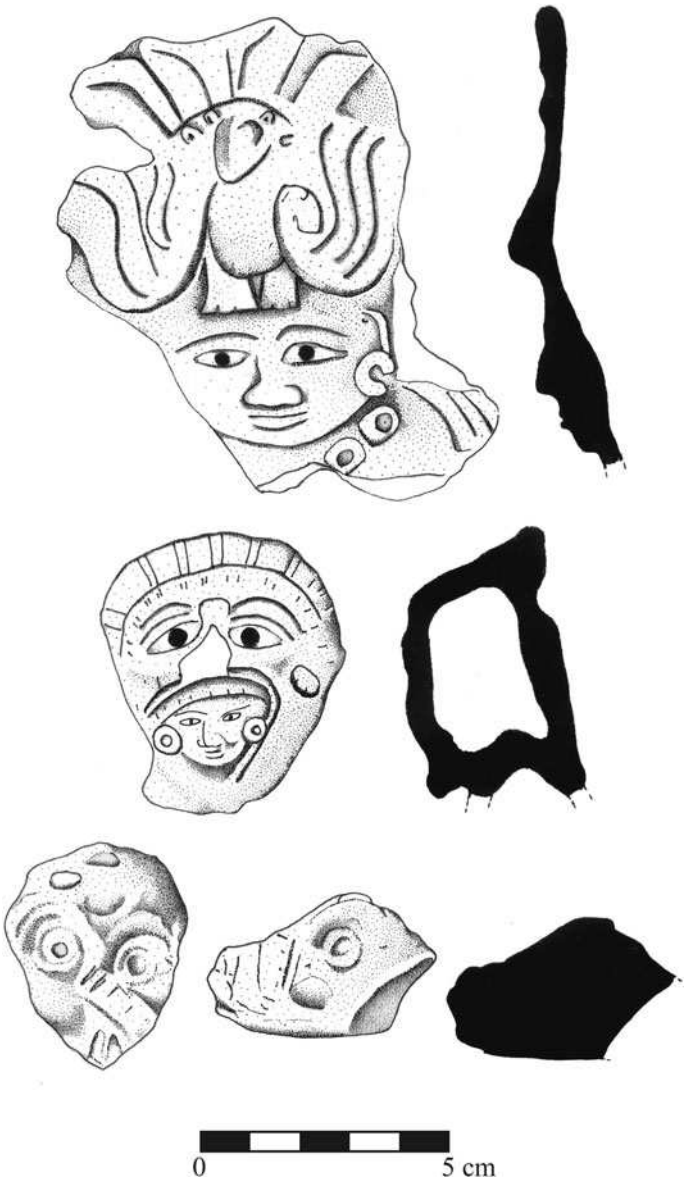

Figure 3. Figurines with avian elements

in the large Río Viejo collection likely represent women, so it is unclear whether or not the fact that these figurine/whistles represent women is uniquely meaningful from a sensory standpoint. We hypothesize that the

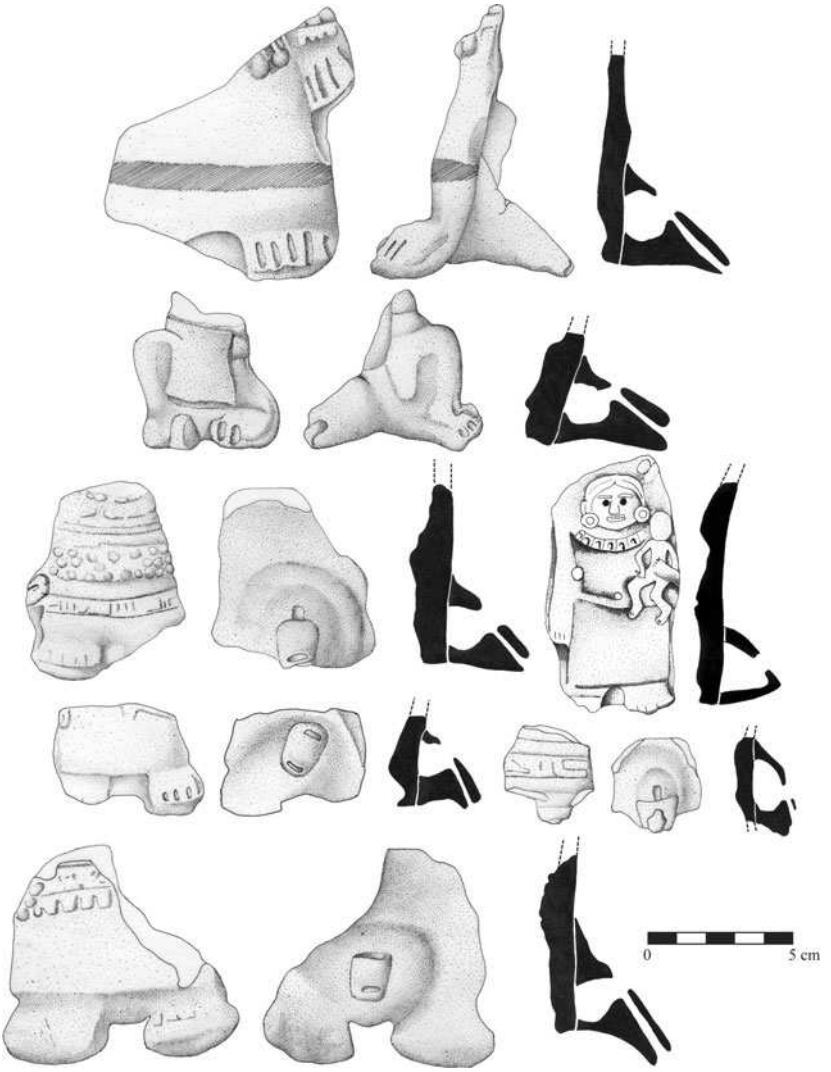

Figure 4. Molded slab figurines/whistles

representation of women in these figures references the divine procreative powers of women in the flowery paradise of the spirit world.

A complete bird whistle produces a much lower, softer sound, perhaps imitating the sound of a bird (Fig. 6; see Electronic supplementary material 1). The frequent inclusion of bird elements in both animal figurines and in the headdresses of human figures is not surprising. The sounds, colors, and movements of birds reference the sacred flowery underworld of the

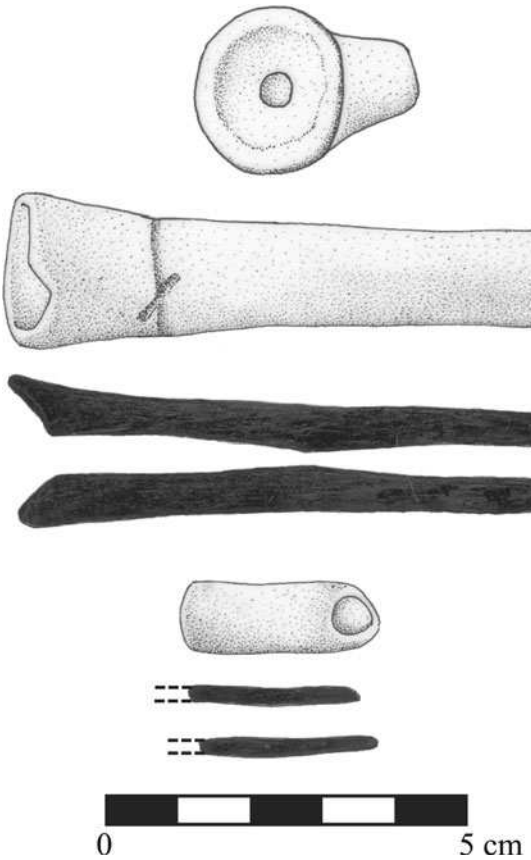

Figure 5. Examples of tube shafts, perhaps part of whistles or tubular flutes. Upper example is a possible trumpet mouthpiece

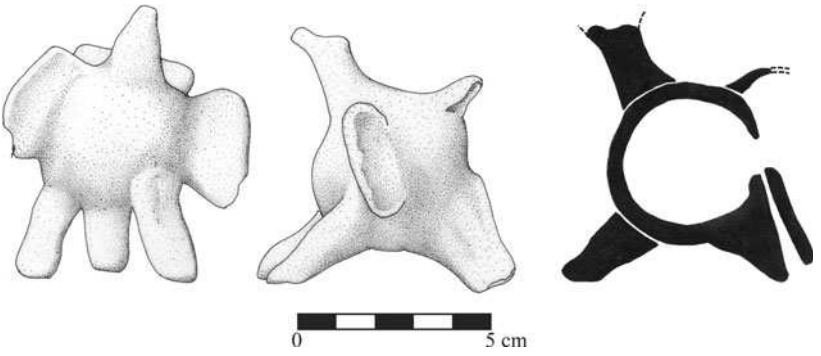

Figure 6. Zoomorphic (bird) whistle

Mesoamerican cosmos. Birds were important animal spirit guides (*nahuales*) for humans in the spirit world of ancestors, and were often depicted as messengers in Mesoamerican iconography (Houston et al. 2006:232–234). Song and birds are often associated with the Mixtec god Lord 7 Flower, *Macuilxochitl*, or in the Aztec world, *Xochipilli*, both of whom are associated mythologically with creation, sun, scent, sound, ancestors, and wind (Houston et al. 2006:278). The rituals in which these whistles were used might have been designed specifically to express, release, and recreate the sensorium of the spirit world, through their sound, color, movement, and elaboration.

Two examples in the Río Viejo collection are exceptional. The first, a tubular whistle, has a closed (solid) cap on the end, which produces a two-tone sound when played loudly, ranging from 1079 to 3455 Hz (Fig. 7; see Electronic supplementary material 1). The other is a nearly complete flute, which has a modeled human face on its terminal end opposite the mouthpiece and stops (finger holes) to create different tones (Fig. 8; see Electronic supplementary material 1). Our experimental acoustic study indicates that these pieces were most likely produced by a specialist with detailed knowledge of instrument manufacture and organology. The four finger holes or stops to produce various notes in a tetratonic scale. It can be played to produce beautiful soft melodies that sound similar to a mod-

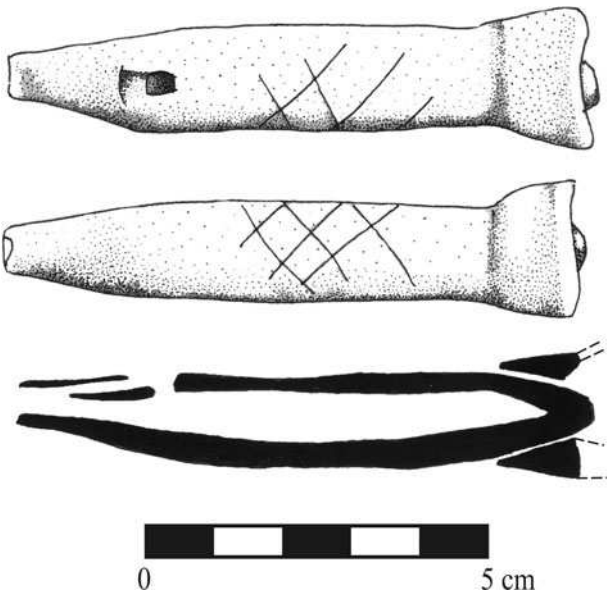

Figure 7. Tubular whistle with false bell

Figure 8. Anthropomorphic tubular flute with finger hole

ern sopranino recorder with impressive sound quality and careful manufacturing skill. This piece is one of only six flutes discovered and reported in archaeological reports in Oaxaca and the only example constructed using clay rather than bone (likely deer). Sánchez Santiago has conducted an extensive analysis of this piece and other aerophones from Oaxaca and has concluded that the six Oaxaca flutes are unique and share a regional or culturally specific feature in the location of the mouthpiece (in Barber et al. 2009; Sánchez Santiago 2005). Rather than indicating a lack of knowledge about proper organology, the similarity more likely evidences a cultural tradition of preferred flute construction, which connects the Oaxaca coast and highlands as sharing specific cultural ideas. The flute would have most likely been used in rituals and activities undertaken at a more local neighborhood/house scale, since the sounds are softer and do not carry as far.

Costume Ornamentation

A major surprise of the Río Viejo excavations was the recovery of a large number of small ceramic items that can be classified as costume ornaments, including pendants, buttons, bells, and earflares. Miniature ceramic vessels were also perforated for suspension and stamps were likely used to decorate skin or clothing (Alcina Franch 1958, 1996). The fitomorphic and zoomorphic designs on many of these pieces have an important sensory

component. Earflares were worn on the ear and other ornaments might have been fastened to cloth to produce sounds and movement as people walked about. In this section, we highlight the earflares and bells that are most closely linked with everyday soundscapes.

We found 64 thin-walled hollow earflare fragments, principally made from a gray paste (n = 47, or 73.4%). The earflares have an average diameter of 2.81 cm and the thin walls average 2.31 mm thick. The only decorations on these thin-walled flares are thin, light scratched incisions around the necks of the flares (present in 18% of the examples), and black or graphite slip in less than 17% of the examples. The scratch-incised flares closely resemble the thin-walled hollow flare illustrated by Grove (1987:Fig. 16.2a). Two examples had a thin flat decorated ceramic plaque spanning the interior of the flare, with intricate incised designs, one in the form of a monkey and another that is more zoomorphic and serpent-like.

Eight earflares are decorated in a floret design and flared only on the forward facing end, with diagonal incisions along the edge and a narrow opening. Similar floret design earflares have been found at Copan (Willey 1994:Fig. 148a). Three other flares are much heavier and larger in diameter (19.9 to 35.7 mm), decorated with four to six flower petals on their forward facing flared ends. These three flares seem rather large to have effectively served as ear ornaments and could have alternatively been used as stamps, spindle whorls, or as costume ornaments (such as threaded through locks of hair) (Fig. 9). The flower and zoomorphic designs on earflares have an important sensory component—the ear is the location of hearing, and orifice that serves as yet another entrance and exit into the spirit world (Houston et al. 2006:143). The flowers and mythical creatures depicted on

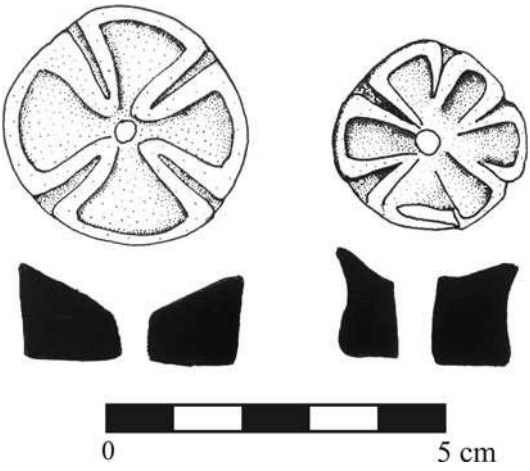

Figure 9. Earflares with flower petal design

earflares, mark this portal between worlds, and might even explain why the monkey, for example, is represented with a large, open vaginal or anal cavity—as a location through which foul sounds, smells, and air travels.

Bells are the most important costume element to our discussion of soundscapes. In total, the excavations recovered 14 fragments of ceramic bells and one complete example. Bells were intentional sound-producing ornaments that would have been suspended from clothing or jewelry, including anklets, belts, and bracelets. All of the bells have hand-modeled looped handles for hanging. The walls of the bell chambers are thin, averaging 2.93 mm thick. One complete and still functioning example of a bell was recovered with the molded clay pellet rattle still inside the chamber (Fig. 10; see Electronic supplementary material 1). The overall dimensions of this example are 28.7 mm tall (length) and 20.8 mm in diameter (across the chamber). Two others have molded bird heads forming the handle.

Ceramic bells have not been found in any other archaeological collection in coastal Oaxaca, and are rarely mentioned as an item found at archaeological sites in Mesoamerica. The Río Viejo ceramic bells are similar in design to the elongated copper bells that comprise some of the earliest bell forms found in West Mexico, which have parallels in coastal South America (Hosler 1994:Fig 3.5, Type 11a). These copper bells, however, were not widely exported from West Mexico until after A.D. 1200 (Hosler 1994; Mountjoy 1969; Pendergast 1962), at which point they become more common in highland Oaxacan assemblages (Batres 1902:Fig. 26; Caso 1965,

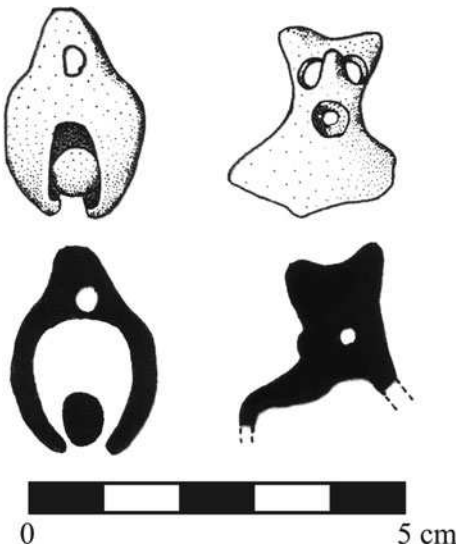

Figure 10. Bells

1969:339). Hosler (1994:122) suggests that bells made from clay predate the introduction of metallurgy to Mexico, but the small corpus of dated examples makes this difficult to support. The only dated clay bells derive from Terminal Classic and Early Postclassic contexts in coastal Guatemala (Shook 1965:192), highland Morelos (Smith 1996:90; 2002), and these examples from Early Postclassic Río Viejo (King 2003), which are all roughly contemporaneous with early West Mexican copper bell manufacture. Another three clay bells from unknown and undated sources are included in the collection of the now closed Frissel Museum in Mitla, Oaxaca (*pers comm* Sánchez Santiago) and the Regional Museum of Guadalajara (Hosler 1994:122).

Elsewhere I have discussed the collection of bells from Río Viejo with reference to what they indicate about interregional connections between the Oaxaca coast and the highlands (King 2008a). However, the bells also signal the important role of sound in everyday ritual and costume elaboration. Hosler's archaeological and ethnohistoric analysis of metal bells is perhaps the best source of information on the meaning and use of bells in Mesoamerica. She suggests that there are several contexts in which bells held special importance (Hosler 1994:233–247). The most common is during any celebration of fertility and renewal, particularly events that were designed to invoke gods of fertility and renewal, including Lord 7 Flower, and the equivalences of Tlaloc (rain), Xipe Totec, and Macuilxochitl. During these rituals, bells were thought to replicate important sounds in the natural world that in Mesoamerican mythology were considered animate and divine, including thunder, rain, and rattlesnakes (Hosler 1994:235; Velázquez and Both 2010). Bell sounds were also thought to protect soldiers on the battlefield, since they reference the sacred world of ancestors. The sounds of bells are a direct reference to the flowery-world, the sacred paradise that is created through sound, song, and smell. Bells are thus associated with birds, feathers, and snakes, and the ubiquitous Mesoamerican feathered-serpent. Music and song were considered appropriate vehicles for communicating with and giving offerings to the gods and was pleasing to the gods, so wearing bells would have aided this communication (Hosler 1994:247). In some ethnohistoric and ethnographic descriptions (e.g. Dahlgren de Jordan 1990 in Hosler 1994), bells were primarily worn by the upper classes or nobility. At Río Viejo, where status distinctions were not emphasized, other rules might have governed who could wear certain costume elements, including bells.

All of the ethnohistoric information cited above refers to metal bells, which make notably clearer sounds and had the added luster of brilliant metal color (Saunders 1998). We argue, however, that clay bells communicated the same symbolic meanings and held the same importance as metal bells. In places where metal bells were not available or metal technology was not yet known, clay bells were perfectly acceptable substitutes. Many

of the Río Viejo clay bells had zoomorphic creatures, including birds, appliquéd onto the top portions of the bell, further supporting the interpretation of a linkage between animals, their sounds, and communication from the divine.

Ceramic Vessels with Rattle Supports

The ceramic assemblage from Early Postclassic contexts includes over 110,000 vessel fragments (Table 1). Fine paste serving vessels (bowls) comprise the largest portion of the assemblage (77.9% by count and 63% by weight). Twenty-nine complete or nearly complete fine paste vessels were found within primary depositional contexts, as offerings in Early Postclassic burials and in middens. Most of these (58.6%) are low-walled tripod hemispherical bowls. The bowls average 3.9 cm in height excluding the supports and 6.6 cm with the support. Most of the bowls are also decorated on the interior with painted geometric or zoomorphic designs using red and white paint (Fig. 11). Designs include birds, stars, scorpions, bar/dot patterns, and unidentifiable animals, possibly monkeys. Although no obvious contents were visible in the base of the bowls, sediment samples taken from the interior of the vessels for microanalysis contained maize phytoliths, as well as somewhat higher pH levels indicative of ash, showing that burned organics or prepared food was placed in the vessels (King 2003).

Along the coast of Oaxaca, somewhat similar ceramics are found at Río Grande, located 20 km east of Río Viejo (Zárate Morán 1995). Considerably further east, at the site of Carrizal, located about 20 km west of Salina Cruz on the Isthmus (and 270 km east of Río Viejo), Brockington (1974:28, Fig. 8) illustrates a vessel that closely resembles the Early Postclassic Río Viejo tripod bowls. He describes this vessel as a rare type in the Isthmus region, a statement that is confirmed through comparisons with

Table 1 Early Postclassic ceramic assemblage summary statistics

	Bowls	*Tecomates* (in-curving high-walled bowls)	Jars	*Comales* (griddles)	Other/ undefined	Body sherds	Total
Total							
Count	6537	28	291	108	3054	101082	111100
Weight (g)	54284	443	6637	1973	15411	515575	594322
% by count	5.8	0.0	0.3	0.1	2.7	90.9	
% by weight	9.1	0.1	1.1	0.3	2.6	86.7	
Identified forms							
% by count	93.9	0.4	4.2	1.6			6964
% by weight	85.7	0.7	10.5	3.1			63337

Figure 11. Painted and burnished designs on the interior surfaces of tripod bowls

published reports of roughly contemporaneous archaeological deposits from Puerto Escondido to the Isthmus of Tehuantepec (Delgado 1965; Fernández Dávila and Gómez Serafín 1988; Long 1974; Zeitlin 1978). Early

Postclassic ceramics also bear little resemblance to wares found in Acapulco and coastal Guerrero (Brush 1969). Ceramic similarities with highland regions, however, are clearer, and include shared design motifs (Cobean 1990:309, Plate 153; Lind 1987:33–40; 1994; McCafferty 1994:65, Fig. 15, 1996:309, Fig. 10, 2001:55–58; Paddock 1966:208, Fig. 260; Spores 1972:32–33, Figs. 4, 5; Winter and Guevara Hernández 2000). Bird motifs, which are common on the coastal bowls, are also commonly represented in the Mixteca Alta (Lind 1987:35). Stylistic comparisons hint that coastal Río Viejo communicated more closely with highland Oaxacan communities than it did with coastal communities to the east or to the west.

The vessel supports are either bulbous or rounded, or are molded into the form of the head of an unidentifiable animal. The animal head effigy supports typically have narrow hollow interiors, while the bulbous and rounded supports are wider with clay pellet rattles in the feet (Fig. 12). Both are found in roughly equal frequencies. A review of sources shows that rattle supports are relatively common during the Early Postclassic across Mesoamerica from Michoacan to Guatemala (e.g. Chadwick 1971:686; Markman 1981:94; Shepard 1948:12; Wauchope 1941:222). In additions, the excavations at Río Viejo recovered 142 loose clay balls, which were probably used for noise-making in rattle supports in vessels that are now broken (among the greater than 110,000 ceramic fragments found throughout the excavations). In other reports, archaeologists have interpreted clay balls as "blowgun pellets," although the difference in interpretation may be based on the diameter of the clay balls (see McCafferty and McCafferty 2006), with larger balls more often interpreted as blowgun pellets. The Río Viejo sample primarily includes small diameter pellets with unimodal clustering for both weight and diameter. The mean diameter of the clay pellets is 11.5 mm and the mean weight is 1.41 g.

While rattle supports are widely distributed in Mesoamerica, they are never discussed with respect to sound production. Based on Aztec accounts, the rattling sound was often linked to rattlesnakes, inhabitants and representative of the flowery world (Hosler 1994:337; Velázquez and Both 2010). In Aztec rituals, rattle sticks were used particularly in agricultural rites (Hosler 1994:236). Rattling sounds in ceramic vessels are described in Sahagún: "And when the rain broke out, then he forthwith arose; he seized his incense ladle….The incense ladle rattled. It was in the form of a serpent. And the serpent's head also rattled….Then he offered incense; to the four directions he raised [the incense ladle]. Much did it rattle; [the incense] spilled out….Thus he attended to the matter; thus he called up the Tlalocs; thus he prayed for rain" (Sahagún 1950–1982:Book 2:151). The ceremony is dedicated to Tlaloc (the rain god) and the rattles were present in the handles of incense burners. By contrast, the vessels with rattle supports at Río Viejo were clearly used for serving food, in burials,

Figure 12. Tripod vessels with rattle supports

in everyday contexts, and probably in ritual events. Zoomorphic and avian images on the bowls communicated messages of transformation and reference journeys to the spirit world. Given that rattle supports were so common, we must assume that the sound-production was essential to their design, use, and symbolic meaning.

Soundscapes in Ancient Coastal Oaxaca

The everyday world, natural world, and divine world were enmeshed and virtually inseparable within a soundscape that was simultaneously real and divine. Many materials in the Río Viejo ceramic collection were made for the purposes of intentional sound-production and referenced sound in multiple ways. Avian imagery is a theme that is present in both the figurine/whistle assemblage and the ceramics, where bird designs were often painted on the insides of serving dishes. The costume detail and avian imagery in the figurines symbolically link these artifacts with the flowery sacred world inhabited by the ancestors, which was filled with birds and butterflies (Burkhard 1992; Hill 1992; Taube 2004), and may even suggest that the figurines themselves represent ancestors (King 2006). Avian images are also included as designs on bells. All of these items, through iconography and function, convey multi-sensory information, with bright avian feather colors, bird song, airy flight, fleeting ephemerality, and jingling costume sounds. Coastal Oaxaca is a birder's paradise with very real examples of enchanting bird song and birds with beautiful multi-colored feathers.

Sound was also ever-present and deeply meaningful in the everyday tasks of food preparation and presentation. In addition to the unintentional sounds that would have accompanied such tasks, the rattle supports on their serving dishes enhanced the sensory experience of food consumption by engaging multiple senses. I have shown elsewhere that food preparation and cooking were tasks that were likely completed in a communal cooking area and would have involved members of different households (King 2008b). The introduction of sound-producing elements to the sharing of food was a means of further tying the community together as a larger communal social group. The rattling of the dishes may have been used for calling participants or signaling readiness, or may have been important parts of rituals to prepare vessels to receive foodstuffs. Likewise, rattling might have been heard during food consumption, when the consistency of the food within the dishes and the use of different utensils may have produced different qualities of sound.

Sound may have also been conceptually interconnected with the sense of *taste* and thus, sound production may have enhanced the meaning of the substance that was going to be ingested. Ethnographic work in Oaxaca has shown that sharing and consuming food in ritual and everyday contexts often resulted in symbolically and physically binding household members to one another (Monaghan 1996) and is thus a common way that household and communities were kept together (Janowski 1995). Sharing food was likened to sharing substance, such that by ingesting particular foods—especially those made by someone else—people were physically

embodying sociality and creating kinship (Meigs 1987; Weismantel 1995). The ingestion of food results in somatic circulation of being, which eventually results in a sweeping or cleansing effusion of fluids from the body, thereby producing self, ensuring health, and restoring balance. The images and designs on the bowls communicated messages referencing the sacred world of ancestors. As a result, commensality simultaneously physically linked people to one another and to the spirit world.

Vessels with rattle supports were also preferred burial offerings. Here, the connection between sound production and ancestors is more directly invoked. Sounds may have been an important part of burial ritual, either to call or invoke the presence of particular ancestors, to aid in the journey of the deceased to the other world, or to complete the presentation of the foodstuffs being offered. Ceramics filled with food or drink were common offerings in burial ritual across Mesoamerica, and are routinely depicted in codices as offerings to deceased ancestors or gods. Although one could argue that the inclusion of rattle-support vessels in burial offerings is the result of rattle supports being common in this assemblage, we are reluctant to argue that the reference to sound production in burial was completely lacking in meaning.

Sound may have also been important to the artifact production process. Sound-making capabilities might have been viewed as necessary for animating or en-livening particular kinds of objects and the capacity for sound production may have enabled or constrained an artifact's eventual use and meaning. Archaeologists who study rock art have shown that the sounds made while carving stone surfaces were likely just as important as the symbolic content of the resultant carvings (Boivin 2004; Ouzman 2001; Waller 2006), such that the sounds produced during production are what made the resultant carvings meaningful (Boivin et al. 2007). At Río Viejo, sound-producing artifacts seem to have been made meaningful through their use. The visual and symbolic content of a costume ornament was less important than the embodied meanings these objects had as they were worn by particular individuals. The action of wearing the pieces—and the sounds they made while worn—were integral to completing the artifact production process. Wearing a costume ornament literally made them make "sense". Without an animating force, the pieces did not necessarily require special treatment or curation. At Río Viejo, costume ornaments always ended up in residential trash deposits and fill rather than in primary contexts such as burials. The level of interest in costume adornments and fancy serving vessels is especially interesting given that wealth differences during the Early Postclassic are not well attested and burial treatment is so strikingly unadorned and uniform. Instead, it must have been in everyday life and use, rather than in disposal or death, that sound-production helped to mark individual identity.

With the exception of the anthropomorphic flute, the Río Viejo whistles create sounds with much accompanying noise. This ''noise'' level can be documented mathematically using a method employed by modern scholars of music, which registers as a lack of clarity in sound quality or tone (see Electronic supplementary material 1). Although such acoustic distortion is considered undesirable by Western standards, we suggest that Río Viejo musicians may have intentionally produced instruments with these windy sounds, perhaps as an acoustical requirement of the particular contexts in which they were used. House walls or thick vegetation may have softened or changed the sounds of the instruments. Instead of reflecting a lack of skill or musicianship, less clear tones may have been the preferred and/or desired effect given the kind of spaces in which they would have been played (Morley 2006:95).

Soundscapes have a spatio-temporal component that helps to define physical space, communicate social boundaries, and engage subjects in multiple ways through time. The Río Viejo neighborhood consists of tightly grouped houses, with corridors between the houses as narrow as one meter wide. Patio space was extremely limited and one's view would have been largely blocked by walls. Yet, wattle-and-daub houses with palm-thatch roofs would have easily permitted the passage of sound. Río Viejo instruments may have been used to announce the progression of a ritual event and encourage participation. Participation in ritual events, however, did not require attendance. The mortuary ritual surrounding the burial of a deceased family member under a house floor within the walls of a home would have been an event that included all community members rather than just those immediately in view. This may be one way in which residential settings were quite unlike elite state-run festivals. Elite rituals were more likely held in venues enclosed by structures made of thick cut stone with different acoustic properties. The sounds associated with a burial ritual in a temple tomb may not have been heard well or would have been heard quite differently by people who were not physically present in the space. The soundscape in a densely-occupied residential area like that of Río Viejo may have been more important than the visible physical landscape. Not being able to escape sounds might have contributed to the strong sense of community evident at Río Viejo. Yet at the same time, like mud houses whose architectural impermanence conveys a symbolic message that houses are highly fluid spaces and require work (Boivin 2000), sound is also transient and fleeting. Sound-production in different contexts using multiple instruments ensured endless opportunities to become enmeshed in communal sociality. Soundscapes were reiterated and reinvented as different needs arose.

Non-visual communication may have been especially important in semi-tropical locations where vegetation was dense, houses were tightly

packed, and neighborhoods were spaced a good distance apart (Feld 2003:226). In a world where people's living space was divided among various houses and buildings, sound-permeable houses allowed for a certain level of transparency and open communication. In a study of an ancient Maya farming village, Robin argues that in spite of spatial segregation of farmers into distant, isolated houses, the sense of community among rural farmers was maintained in part through shared work areas, use of exterior house spaces, and non sound-proof wattle-and-daub houses (Robin 2002). At Río Viejo, the situation was different. Houses were closely spaced and outside patio-space was virtually non-existent. Yet, due to limited visibility, sound may have been an important way that a communal ethos was maintained, contributing to what looks like a largely egalitarian social structure.

In ethnographic work, anthropologists from around the globe have often pointed to the acuity of the non-visual senses in rural areas, especially in tropical settings where visibility is limited (Devereux 2006). Anecdotally, we must add just how keen a sense of sound and hearing contemporary rural farmers in Mexico have, how silently they are able to move through dense (even dry) vegetation, while the archaeologist follows clumsily and ever so loudly behind. People we have worked with continue to utilize sounds consisting of whistles and yelps to call to one another in fields and forests where visibility is limited. These sounds can be heard and understood across great distances, producing an effective non-linguistic form of long-distance communication.

Conclusion

In this paper, we have discussed various sound-producing artifacts found at Río Viejo and have tried to show that sound was an important part of everyday life and household ritual. Much like state rituals, where a sensory onslaught was linked communication with gods and ancestors, in everyday contexts, sound-producing artifacts were used to invoke these same beliefs and practices on a smaller scale. People wore jingling clothing and walked around bedecked with glittery ornaments, which both enhanced the symbolic message of the costume and marked individual identity. They ate from en-livened ceramic vessels that contained en-livened foodstuffs. Sounds created a shared spatial landscape that all community members were part of, even in the absence of visible attendance at a given event. The walls of the houses would have restricted sight lines and created echoes and reverberations that might have distorted or improved the sounds produced by these artifacts. The permeability of the construction allowed the

sound to pass and would have drawn a larger group of people into overlapping soundscapes.

For the pieces that we have described here, the sound production qualities and multi-sensory references are intentional and integral components of their manufacture, use, and meaning. While state ritual (especially as described in Aztec accounts) was purposefully loud and engaging, sounds in the Río Viejo soundscape were sometimes subtle and more omnipresent. The sounds of intentional sound-producing artifacts were interwoven with a background soundscape that included ambient and unintentional sounds such as voices, sounds of nature, and the noise stemming from the hustle and bustle of everyday activities. The addition of a highly varied corpus of sound-producing artifacts allowed Río Viejo residents to create an intentionally constructed soundscape that blended the natural, cultural and divine worlds in unique and ever-shifting ways. The Río Viejo data make it clear that a consideration of everyday soundscapes is absolutely critical to consider in our interpretations of non-elite daily life in ancient Mexico.

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