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The Sound of Thunder: A Turtle Shell Idiophone in Classic Maya Culture

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Abstract

The turtle shell idiophone is an instrument known from iconographical and archaeological sources from the Preclassic through the Classic Period of the Maya culture (250 BCE – 900 CE). It appears in historical scenes depicting ritual sacrifices, processions, and dancing, and is typically included in a percussion band along with gourd rattles and a tall, cylindrical drum. The mythological contexts of the turtle shell idiophone appearance provide more information on the possible symbolic significance of its sound. The author analyzes all known depictions of this idiophone and contextualizes them with archaeological findings, providing comprehensive information about the way this musical instrument looked and contexts of its use. Ultimately, the interpretation of the turtle shell's sound as symbolically connected to the sound of thunder is verified.

Keywords

Ancient Maya culture – Ancient Maya music – Ancient Maya iconography – Turtle shell idiophone

The Pre-Columbian Maya musical instrument made from a turtle shell is known primarily from iconographic sources showing individuals holding an oval object covered with a cross-hatched motif characteristic of representations of turtle carapaces.[1] These individuals are usually members of musical ensembles. The turtle shell is held under one arm, and sometimes the other hand, holding a deer antler, is visible. Therefore the viewer of such a scene can assume that the striking or scraping of the turtle shell (a hollow object) with a deer antler (a solid object) was the standard method of making the object sound. The iconographic sources suggest that the deer antler was most commonly used for striking the ventral part of the shell, known as the plastron, which is also

[1] The turtle shell consists of two components – the upper dorsal part is called a carapace, and the lower ventral one is called a plastron.

confirmed in the ethnohistorical sources (Civellero 2017). Since this instrument was recognized in iconography, some archaeological finds of turtle shells have been interpreted as idiophones.

According to the Hornbostel and Sachs classification system, the turtle shell is a directly struck, percussion vessel idiophone (Hornbostel and Sachs 1961: 111.24). Because scutes on the edges of the plastron have different thicknesses, it has the potential to generate two sounds of different pitch (Martí 1968: 35).

This kind of instrument is also known from ethnohistorical sources and modern observations of indigenous Maya music (Tozzer 1966; Vogt 1977). The turtle shell idiophone, called *ayotl* in Nahautl, was also used by the Aztecs. In iconographic sources it is also depicted as being struck with a deer antler. The figurines of musicians playing the turtle shell with a deer antler were found for other Precolumbian cultures, like Colima, Zapotec, and Gulf Coast cultures (Méndez Rojas and Pímentel Díaz 2010: 185). Turtle shell idiophones are used today by many indigenous groups of the Americas, with the shell being struck by a wooden club, claw, or deer antler (Civellero 2017), or used as a rattle (Gillreath-Brown and Peres 2017).

In the literature on Classic Period Maya religion and rituals, the sound of the instrument is said to symbolize the sound of thunder (Reents-Budet 1994; Quenon and Le Fort 1997; Zender 2006). In this text, I discuss detailed descriptions of the appearance and contexts of the use of the turtle shell idiophone in iconographic and archaeological sources, and I verify the existing interpretation of the symbolism of its sound, with the aim of revealing the complex nature of using the sounds of turtle shell idiophones and other musical instruments or objects in the Maya rituals. I will start with the emic introduction of the turtle and turtle shell based on the linguistic sources from the Classic Period.

1 Turtle shell idiophone in Maya epigraphy

The abovementioned cross-hatched pattern is a characteristic feature of a logogram representing the turtle shell with a phonetic value of AHK – meaning "turtle". Another sign related to the turtle is MAHK, which appears as the name of one of the Haab months (those of the solar year). Both signs represent the outline of the turtle shell, but in the case of MAHK, the carapace has a pattern of three or four black triangles (Zender 2006: 2). While AHK seems to be a pictographic sign, MAHK is translated as "shell". There are few inscriptions that are related to the use of the turtle shell as a musical instrument, although so far, we don't have evidence that the Pre-Columbian Maya used a separate word for naming this object as a musical instrument.

In Cahal Pech, Belize, an incised turtle shell was found in the elite Burial B1–2. The state of preservation was fragmentary; however, Awe and Zender read individual glyphs and arranged them into possible phrases:

(1) aku A.56J...	*Ahk Aj* ...	'turtle, he of ...'
(2) uju ...	*uju* ...	'his / her / its ju ...'

(3) K'AN-na- *HIX-...-wa	*K'an Hix ...w*	'Yellow / Tawny Jaguar ...'
(4) yu -...	*yu ...*	'his / her / its ...'

(Awe and Zender 2016: 158)

Even though only a small part of the inscription was preserved, it allowed the interpretation of a dedicatory formula: *ujuuch(il) akh aj* "it is the turtle shell of aj-" (ibid.). There are known instruments, for example, clay drums marked with similar formulas, in which the name of the item and the name of its owner appear (Ciura 2021). It is thus possible that it was a musical instrument, as the authors describing the artifact suggest, although its name, "turtle shell" is not directly connected to its sounding properties.

On the other hand, another, fully preserved, inscribed turtle shell bears the glyph naming this object as *yu-k'e-sa*, which may mean "weeper" (Houston and Tokovinine 2013). This "label" was apparently not designated for a specific instrument because the same word appears on a conch shell trumpet (Chrysler Museum of Art, #86.457). It may then be a reference to the sound of these instruments or the context of their use.

2 Depictions of the turtle shell idiophone

Depictions of the turtle shell idiophone appear on a wide array of visual media including vase paintings, murals, and figurines, with most of them dating to the Classic Period (250 BCE – 900 CE). The key to the presentation of the iconographic material is the context of the scene, I will start with the mythological scenes, and move to the historical ones.

The earliest known representation of this instrument is in a scene depicting a mythological narrative related to the Maize God, painted on the west wall of Structure Las Pinturas Sub-1 in San Bartolo, Guatemala (Figure 1). The mural is dated to the Preclassic Period, about 100 BCE (Chin-

Figure 1: Maize God (center) playing the turtle shell idiophone. San Bartolo, Structure Las Pinturas Sub-1. Drawing by the author after the reconstruction painting of Heather Hurst.

Figure 2: Mythological scene with the Maize God emerging from a cracked turtle shell also showing Chaak, and two Paddlers in canoes, vase K731. Photograph by Justin Kerr. Justin Kerr Maya archive, Dumbarton Oaks, Trustees for Harvard University, Washington, DC.

chilla Mazariegos 2017: 156). The Maize God is depicted inside a turtle shell, represented in a quatrefoil manner, which was typical for representations of caves and portals. He is dancing while he beats a turtle carapace hanging on his neck with a deer antler or a bird claw (Saturno 2016: 139), and is flanked by two sitting characters: the rain god Chaak and another deity interpreted as an anthropomorphic version of the Waterlily Serpent (Chinchilla Mazariegos 2017: 222) or a god of freshwater (Saturno 2016: 139). The image of the turtle is part of a larger visual narrative. The scenes painted on both sides of the turtle may represent the Maize God's death in water and his rebirth (Chinchilla Mazariegos 2017: 221f.).[2] The music-making by the Maize God seems to be connected to his journey towards rebirth and the establishment of his relation with the pluvial deities.[3]

Another related mythological scene, though painted later, is depicted on vase K731[4] (Late Classic Period), showing four supernatural characters, three of which are standing in canoes while the

[2] In many iconic representations of the Maize God's resurrection (e.g. the Resurrection Plate, K4681, San Bartolo murals), a young man with an elongated skull emerges from a broken turtle shell. The turtle is interpreted as a symbol of the earth, the metaphor of the entire world, the so-called "cosmic turtle" (Looper 2009: 119). Zender (2006) came to a more precise conclusion, that the carapace symbolizes the dry, cracked earth, a layer that plants can break through with the flow of rain. This turtle-earth is connected to Old God, God N (e.g. God N is emerging from the turtle shell aperture), which signals the role of this supernatural entity in the resurrection. Additionally, the rear aperture of the turtle shell creates an occasion for the appearance of other beings, e.g., K'awiil – the god of lightning.

[3] Interestingly, the mural shows traces of breakage, possibly caused by someone hitting the painting with an axe, a gesture that symbolically helped to open the turtle shell, which was necessary for the Maize God's rebirth (Saturno 2016: 139).

[4] All K-Numbers in this article relate to Justin Kerr's Maya Vase Database: mayavase.com.

Maize God rises from a crack in a turtle shell (Figure 2). From the apertures in the shell, two old beings emerge. They bear features characteristic of God N, a deity related to the quadripartite structure of the world, who holds the earth and the sky.[5] Next to the Maize God, we can see a character with features of both Chaak, the rain god (with its characteristic head and death-eye collar), and K'awiil, the god related to lightning (sporting legs with a snake pattern), and holding a stone which can be interpreted as a device for creating lightning. The turtle shell instrument is held by a character standing in the canoe behind Chaak, who is identified as the Stingray Paddler by Marc Zender (2006: 8. See Figure 3a). We can see both parts of the shell – the carapace with a cross-hatched motif and the plastron marked with parallel, wavy lines. Additionally, a round element marked with the *k'an* cross[6] is added to one side of the shell. It may be a gourd serving as an additional resonance chamber. Another interpretation is that it is a gourd filled with corn, because the *k'an* cross can symbolize a yellow substance (Quenon and Le Fort 1997: 894). The musician is holding the instrument under his left arm; the shell itself is large, extending from the upper part of the chest and above his head. In his right hand, he holds a deer antler. The last person standing in the canoe is the Jaguar Paddler, who has jaguar spots on his face and is wearing jaguar pelt gloves. He is also holding a long object, which looks like a paddle, though with unusual features.[7] This mythological scene most likely reflects the moment of the Maize God's resurrection, complete with a thunderstorm, in conjunction with the presence of Chaak holding a stone associated with lightning. In these circumstances, the turtle shell instrument is interpreted as imitating and summoning the sound of thunder (Zender 2006: 10). The characters' placement in canoes, and the company of two supernatural Paddlers – who in other scenes are depicted as guiding the Maize God through

[5] God N is a supernatural entity as based on iconographic features initially recognized by Paul Schellhas (1904: 37–38) in his classification of Maya deities depicted in the Postclassic codices. The Classic Period version of God N was recognized as old, wrinkled, and bald, wearing simple clothing and a headwrap with a netted pattern. Often, he is depicted inside (or wearing) a turtle or mollusk shell marked with the '*k'an* cross', a quadrapartite sign, which is a logogran meaning "yellow, precious, ripe" (Stone and Zender 2011: 127; Martin 2015: 188). The variants of the Classic Period God N's name were transcribed as *Chan Itzam Tuun*, "Four Stone Itzam", and *Itzam K'an Akh*, "Itzam Yellow/Precious Turtle" (Martin 2015). Simon Martin (2015: 191) described God N as belonging to the Old Man complex, a group of beings sharing common traits in iconography and script. He sees God N as the quadrupled being, supporting the sky or even the whole world, related to four cardinal directions, associated with cosmic mountains and water.

[6] On the *k'an* cross, see n. 7. In one of the Maize God resurrection scenes, it is depicted in the turtle's carapace center in the crack from which the Maize God emerges. In this context, it is interpreted as denoting the importance of the hole from which the Maize God arises (Quenon and Le Fort 1997: 896). Another explanation is that it marks the 'center', the base of the axis mundi, the cosmic tree, which is maize (Martin 2015: 191). Looking at the visual form of the sign, *k'an* is a simple cosmogram, representing the four directions. As was summed up by the researchers analyzing the Early Formative Maya symbols: "This structure is associated with concepts of creation, cyclical completion, cardinal directions, lineages, gods, and colors. All of these concepts are embedded in the *k'an* cross – it is perhaps the most fundamental symbol of the Mesoamerican world and is found throughout Mesoamerica spatially and temporally" (Garber and Awe 2009: 157).

[7] The paddle blade is not rectangular but more wing-like with a pointed end, which led Taube (1985) to identify it as a digging stick – an agricultural tool. It may also be a conflation of a paddle and a digging stick, a tool used in swampy river areas (Quenon and Le Fort 1997: 893).

Figure 3: Left: one of the supernatural paddlers playing a turtle shell idiophone. Detail of the scene on vase K731. Drawing by the author after the photograph by Justin Kerr. Right: a supernatural being playing a turtle shell idiophone. Drawing by the author after the photograph published by Reents-Budet (1994: 207).

the watery Underworld – suggest the mixing of two episodes from the Maize God's mythological journey (Chinchilla Mazariegos 2017).

A very similar scene appears on the fragment of a ceramic vase published by Reents-Budet (1994: 207). Originally, at least three characters were depicted as standing on a watery band, their legs being still recognisable, but only one – a turtle shell player – is fully preserved (Figure 3b). The instrument is smaller than the one on vase K731; the carapace is depicted frontally, and again, there is a rounded shape attached to the bottom aperture of the turtle shell. The instrument is held under the left arm and hit with a deer antler. Another figure to the player's right is only partly preserved, but may be deduced from the presence of a paddle/digging stick and a jaguar foot. This is the same Jaguar Paddler as depicted on vase K731. On the left side, the legs of the unidentified character and the back of the big feathered headdress are visible.

There are more mythological scenes representing a turtle shell idiophone as part of a musical ensemble, usually comprised of percussion instruments. One of the typical forms of such an ensemble is a percussion trio in a standard sequential order of musicians, starting with a rattle-player, followed by a drummer, and ending with a percussionist playing the turtle shell. On vase K530, the action most likely takes place in a cave, a mountain interior, or the Underworld, which is indicated by a zoomorphic head of the Earth Monster that also serves as a throne occupied by the rain god Chaak (Figure 4). In front of the throne is an assembly of old men assisted by young women. Each of the old men has a name tag, including the ITZAM logogram, which clearly indicates that these characters belong to the Old Man/Old God complex (Boot 2017; Martin 2015). The fact that there

Figure 4: A typical percussion trio including a rattle player, a drummer, and a turtle shell player in a mythological scene taking place in the cave; vase K530. Photograph by Justin Kerr. Justin Kerr Maya archive, Dumbarton Oaks, Trustees for Harvard University, Washington, DC.

are four of them may be associated with God N as the quadruple world bearer. They are involved in a ceremony, a ritual enema and feast performed to the accompaniment of music. The three musicians constituting the percussion trio look identical to Chaak, a fourth figure in this section of the scene, shown sitting on his throne. So in total, there are four Chaaks, four Itzams (old gods), and six women in the scene. The rattle player is depicted in the upper register, and the drummer and turtle shell player are shown sitting below. The turtle shell is oval, with its cross-hatched carapace clearly visible. The marginal scutes are painted blue, and the edge of the shell is wavy. The instrument is held under the musician's left arm and covers his entire chest. Above it, a fragment of white deer antler appears.

Relatedly, vase K3007 shows a mythological event in the 'heavenly' realm, as indicated by the sky band in the upper register of the scene. The musicians, depicted inside a structure marked with the *muyal*, "cloud" symbol, are older and dressed alike in rather simple clothing with ornaments in their ears. The turtle shell is held in front of the musician's chest, but the object used for striking it is not visible.

Vase K5506 is unfortunately only partially preserved, which makes its meaning difficult to understand (Figure 5). What can be discerned are three figures, two dancing while facing one another. They wear rich costumes marked with death symbols, such as bones and "death eyes". The third figure is probably the Maize God, or an impersonator of the same. One of the dancing characters is playing a rattle. Creating the duet, the figure in front seems to be holding a tiny turtle shell in one hand and a large, long bone in the other – which is a unique representation of this type of object used for hitting the shell.

One Codex-style scene from vase K1645 shows a turtle shell which is not played, and not even held by the musician (Figure 6). It is depicted lying on a bench, next to a small drum with a jaguar membrane, which helps indicate the identification of the shell as a musical instrument. The scene takes place in a supernatural palace and features two Bundle Gods and a child sacrifice placed on a plate, being burned or incensed (Steinbach 2015).

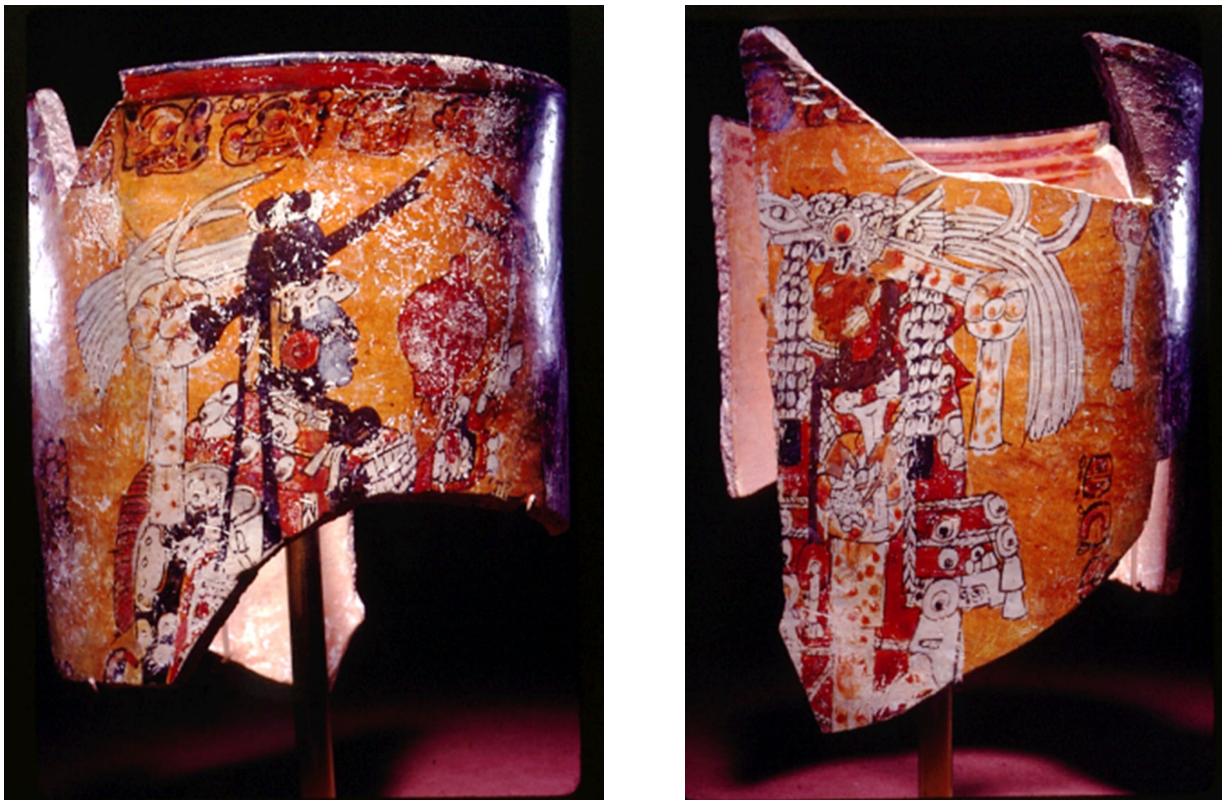

Figure 5: Scene representing two musicians playing a gourd rattle and a very small turtle shell idiophone; vase K5506. Photograph by Justin Kerr. Justin Kerr Maya archive, Dumbarton Oaks, Trustees for Harvard University, Washington, DC.

A turtle shell is also depicted on supernatural-themed figurines from the Late Classic Period. Three represent a person with a duck-billed face – interpreted as a ritual clown (Taube and Taube 2009) or as a duck-billed wind god or masked impersonator[8] (Stone and Zender 2011: 175). Two of these figurines come from Jaina[9] and show a very small shell, which is proportionally the same size as a figure's hand (Figure 7). The third figurine without known provenance (Zalaquett Rock 2021: fig. 22) represents a duck-billed person holding a shell the size of his torso under his right arm and beating it with a deer antler.

A musician is represented on a figurine from Copan (Figure 8): it is a man with skin distortion in the area of the chin and cheeks, where round dimples appear, which may reflect the transformation into or spiritual coexistance with an animal.[10] He is holding a turtle shell under his

[8] The duck-billed character is said to be a form of the wind god, the one connected to Central Mexican traditions (Taube 2004; Katz 2018: 197). In other scenes, he is depicted dancing and singing (San Bartolo West Wall mural, Pinturas Sub-1A) or playing rattles (Stela 3, Seibal). Music and wind were related in Classic Maya culture, and it seems that music was considered an air-like substance (Taube 2004: 74).

[9] Figurine K3550 in Kerr's Precolumbian Portfolio and figurine from the collection of Museo Nacional de Antropología in Mexico published by Zalaquett Rock (2021: fig. 21).

[10] The faces with patches of unnatural, dimpled skin may be analogical to the logogram WAY, which is translated as "animal co-essence, animal spirit" and which represents the sign AJAW, "ruler" partly covered with jaguar skin. Such mixing of human and animal features may be a reference to the transformation or the double existence of a human and animal counterpart. Other examples of such a representation in the art are the drummer figurine K5785 and rattle-player depicted on the vase K1507.

Figure 6: Turtle shell not played, lying on a bench, vase K1645. Photograph by Justin Kerr. Justin Kerr Maya archive, Dumbarton Oaks, Trustees for Harvard University, Washington, DC.

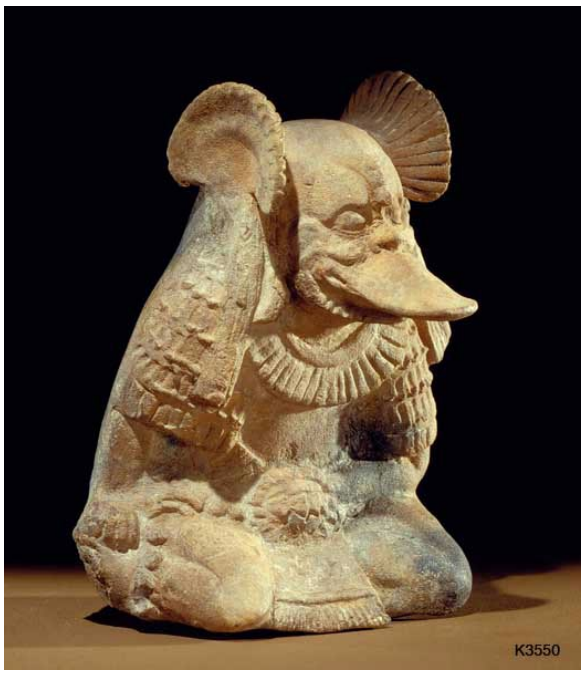

Figure 7: Figurine K3550 representing an anthropomorphic figure with a duck-billed face or mask holding a small turtle shell idiophone. Photograph from Justin Kerr's Portfolio. Justin Kerr Maya archive, Dumbarton Oaks, Trustees for Harvard University, Washington, DC.

left arm; the shell is round and has a spherical attachment at the bottom, similar to the one represented on vase K731. The musician is hitting the shell with a stick with a rounded end. A cloth is wrapped around this attachment and the musician's neck and right shoulder, creating a carrier for the instrument (Zalaquett Rock 2021: 50).

Other scenes featuring the turtle shell as part of a percussion ensemble appear in contexts depicting human activities – palace events, rituals, wars, or processions. On vase K8947, the percussion trio stands at the entrance to a cave, symbolized as the zoomorphic Earth Monster (Figure 9). The depicted environment also features elements characteristic of a palace interior, such as walls and a throne; however, the throne is placed on the body of the Earth Monster, and the wall is

marked with the quatrefoil symbols of caves and the Underworld. Thus, it seems that we are looking at an event happening on the border between the human realm and the Otherworld. The inscriptions scattered throughout the scene were deciphered by Houston (2018: 65) as *5 Imix t'abayi ik'il ook*, "on the [day] 5 Imix, they rise up, the musical [windy] feet" or by Hoppan (2019) as *5 imix t'abaay ik' nal*, "on the 5 Imix, Ik' Nal ('the place of the primordial wind') is inaugurated". The musicians forming the percussion trio are dressed nearly identically, in richly embellished outfits including bracelets, anklets, beaded necklaces, and ear ornaments. Their instruments also have decorative features and are made of luxurious materials (a rattle with feathers, a drum with a jaguar skin membrane). In the scene, the turtle shell idiophone looks very natural; it is cream-colored (matching the two-tone color palette of the vase), and is oval with a smooth edge. The instrument is held diagonally under the right shoulder and is very large, covering the entire chest of the musician. The other hand, or object, with which the shell may have been hit, is not visible.

Figure 8: Figurine from Copan of a musician with skin distortion playing a turtle shell idiophone held in a cloth. Drawing by the author after a photograph published by Zalaquett Rock (2021: 51).

A percussion trio appears in a unique context in the scene of scaffold sacrifice, as shown on vase K2781 (Figure 10). To the viewer's left, there is a group of warriors with large headdresses and holding spears; while behind them, a percussion trio and three trumpeters flank the scaffold on its right. This particular combination of the percussion trio with two or three trumpets was apparently common in the arrangement of Classic Maya ensembles, although these two groups are usually visually separated (Stöckli 2011). All the musicians wear similar white loincloths with red patterns and fringes, but their headdresses differ. The turtle shell idiophone is held under the right arm of that musician; its central part is orange, and the sheath white, with a smooth edge, and a fragment of deer antler in white visible over the shell.

The next group of depictions shows dance and procession events. On vase K6294, six individuals are depicted in a row facing the same direction. This arrangement may imply a kind of forward, processional movement (Figure 11). One individual is depicted in a dancing pose, and two others are held up on the backs of other males, performing vivid gestures. The participant standing in the middle is holding an oblong object near his mouth, which may be a cigar or a trumpet. Judging from a trophy head attached to his hips, he is likely a warrior. The edge of the scene is marked with a vertical glyph band containing a Primary Standard Sequence[11], with a musical ensemble

[11] The 'Primary Standard Sequence' is the dedication formula usually painted under the vessel's rim. It contains basic information about the shape and purpose of the vessel, and occasionally also includes the name of the owner and/or the painter.

Figure 9: Percussion trio standing before the zoomorphic Earth Monster but also in the palace interior, accompanying a dancer performing before a throne; vase K8947. Photograph by Justin Kerr. Justin Kerr Maya archive, Dumbarton Oaks, Trustees for Harvard University, Washington, DC.

Figure 10: Percussion trio and trumpeters performing for a human sacrifice; vase K2781. Photograph by Justin Kerr. Justin Kerr Maya archive, Dumbarton Oaks, Trustees for Harvard University, Washington, DC.

leaning forward from behind it. The ensemble is comprised of three trumpets, a tall, cylindrical drum, and a turtle shell held in front of the musician's chest. The shell, showing the plastron side, is light green and has an unusual shape, with two longitudinal protrusions at the top, perhaps representing the aperture. The percussionist's left hand holds an antler that is also visible. The musicians have identical headdresses: a headband with a flower over their foreheads, which is also worn by the two figures carrying dancers on their backs. This suggests that they all belong to the same group of people preparing to assist in the ceremony.

A very characteristic type of depiction featuring the percussion trio is represented by the so called Chamá-style scenes showing processions in zoomorphic costumes.[12] Four such scenes include musicians (K3040, K3041, K3332, K5104), and three show the entire percussion trio (Figure 12). All the characters are depicted in a row with one leg extended, suggesting a processional movement. However, the presence of the immobile, tall *pax* drum in the row of participants either un-

[12] The Chamá style developed in the Chixoy River Valley, Alta Verapaz (part of the Maya Highlands), in the Late Classic Period. The motifs depicted on Chamá-style vases draw from the Lowland Maya culture and the style is characterized by a red, black, and orange color palette added to chevron motives around the rim and base of the vase.

Figure 11: Dancing procession accompanied by musicians; vase K6294. Photograph by Justin Kerr. Justin Kerr Maya archive, Dumbarton Oaks, Trustees for Harvard University, Washington, DC.

dermines this interpretation or proves a conceptualized, unrealistic representation of the location of the drum in this event.[13] The turtle shell idiophone in all three cases is held under the left arm of the musician, and the carapace side is visible. On two vases (K5104 and K3041), the carapace is marked with a *k'an* cross, otherwise, the instrument displays features specific only to these three Chamá-style scenes. The shell is more angular with a rectangular aperture and its visible edge is straight and marked with semicircular lines, which doesn't look like a natural feature. It may be a result of the painting style or represent a modification of the instrument. The semicircular lines along the edge may represent grooves which would create an additional scraping sound if rubbed with deer antlers. That said, there is no archaeological or ethnographic evidence that would confirm a practice of shell modification.

The largest scene of a public ritual including a procession of musicians is the one represented in the Bonampak murals. The musical ensemble depicted in Structure 1, Room 1, comprises five rattle-players, one drummer playing a *pax* (skin drum), three turtle shell players, and additionally – separated from the percussion band – two trumpeters, and one additional rattle-player. This is the combination of instruments typical for a Classic Maya ensemble, although in Bonampak murals, the number of musicians is increased. Three turtle shell players are depicted on the right, holding deer antlers in their right hands and shells with plastrons facing the viewer held under

[13] Miller (1988) noticed, that the drummer playing the *pax* (the skin drum) represented on the mural in Room 1, Bonampak was standing while the rest of the musicians were following the procession (he is depicted frontally while others are depicted from the side) and proposed that the musicians were moving around the drummer. This may also be the case with other depictions of musical bands including this large standing drum.

Figure 12: (Top): procession of zoomorphic characters forming a percussion trio; Chamá-style vase, K3040. (Middle): procession of zoomorphic characters, including a percussion trio, Chamá-style vase K3041. The turtle shell has a *k'an* sign on it, although part of the sign is covered by the musician's arm. (Bottom): procession of zoomorphic characters, including a percussion trio, Chamá-style vase K5104. The turtle shell has a *k'an* sign on it, although part of the sign is covered by the musician's arm. Photographs by Justin Kerr. Justin Kerr Maya archive, Dumbarton Oaks, Trustees for Harvard University, Washington, DC.

their left arms (Figure 13). The shells are brown, oval-shaped, and large; the antlers are also brown and V-shaped. The percussion ensemble is visually unified by the uniform wearing of similar tall white headwraps. Another ensemble is depicted in Room 3, where musicians are squeezed in the upper register of the scene, next to dancers performing on stairs and wearing enormous headdresses. The rattle player is visible at the front of the group, and the drummer is carried on a litter. The other musicians are not clearly visible, but at least two are holding oval shapes under their left arms, possibly representations of turtle shells.

Another percussion band is depicted on a polychrome drum in the collection of the La Ruta Maya Foundation (Krempel and Paredes Maury 2017). In the lower register of the scene are seven

Figure 13: Musicians playing turtle shell idiophones, detail of the mural in Room 1, Bonampak. Yale University Art Gallery; gift of the Bonampak Documentation Project; illustrated by Heather Hurst, M.Phil 2006, Ph.D. 2009, and Leonard Ashby.

musicians, separated into two groups by a dedicatory text. A standing trio of rattle players is depicted on the left of the text. On the right, there is a percussion band led by a rattle player performing energetic movements that suggest dancing, while the drummer, turtle shell player, and a person who is clapping his hands are sitting with mouths open, perhaps singing (Figure 14). The large oval turtle shell is held under the left arm. The members of the percussion ensemble are dressed in similar turbans with dark dots.

Figure 14: A musician playing a turtle shell; a member of the percussion band depicted on the polychrome ceramic drum from La Ruta Maya Foundation, Guatemala, Cultural Property Registry no. 1.2.179.0155. Drawing by the author after a photograph published by Krempel and Paredes Maury (2017: fig. 2).

3 Turtle shell idiophones preserved in archaeological material

As an archaeologic relict, a natural object like a turtle shell is difficult to identify as musical instrument. For the Classic Maya, a turtle was the source of a variety of commodities, such as meat or material for ornaments, not to mention its symbolic meanings connected to water, earth, and the Maize God. Therefore, when its remains are found in archaeological contexts they could reveal many possible functions, some perhaps overlapping. It may also be problematic that turtle shell remains are described with varying degrees of accuracy in the archaeological literature. To wit, archaeologists do not always state which parts of the shell were preserved. One reason for these impre-

cise descriptions is the poor state of preservation typical of the material, a fact which absolves archaeologists of charges of imprecision, at least in this regard.

The first clue to the identification of a turtle shell idiophone is the *in-situ* finding of a whole shell or fragments of both the carapace and plastron without remains of a skull or limbs. This implies that the shell, and not the whole animal, was deposited. The second clue is the beater. The object paired with the instrument is most often a deer antler, shown in iconography as the prescribed object used to hit the surface of the plastron. This association occasionally appears in archaeological contexts. Other clues that favor identification as a musical instrument are traces of use, its presence in material assemblages of other ritual objects, and its presence with known musical instruments, such as drums or aerophones. Additionally, many turtle shells identified as possible instruments have small perforations, which could have been used for suspension. This means for holding the instrument have not been observed in iconography, but it is possible that some instruments were suspended, facilitating their mobility in performance. This said, when remains of a turtle shell contained features allowing for its interpretation as a musical instrument, and the species of the turtle was possible to identify, it turned out to be *Dermatemys mawii*, *Terrapene mexicana, Trachemys venusta, Rhinoclemmys areolata*, or a species of the Kinosternidae family. There are quite significant differences between the shells of different species, e.g. the shell of the *Dermatemys mawii* can measure up to 60 cm in length while the species from the Kinosternidae family measure between 12 and 17 cm (Lee 1996: 149–63). Such differences in size result in different acoustic properties, and such acoustic analyses and comparisons would be an interesting next step in archaeomusicological research of Maya culture.

Turtle shells identified as instruments were found in Classic Period residential contexts in Aguateca (Emery 2014), Caracol (Teeter 2001: 323), and Piedras Negras (Emery 2007: 63). However, by far the most common context of turtle shell finds is a burial one. A turtle shell was found among rich funerary gifts in Late Preclassic Burial E in Chan, Belize (Kosakowsky and Robin 2010: 48) and Early Classic Burial 8 in Mound 20, El Mirador, Guatemala – this specimen exhibits traces of red pigment and has suspension holes (Agrinier 1970: 30–31). Three large turtle shells were found in an Early Classic burial in Structure 7, Santa Rita Corozal, Belize (Zalaquett Rock 2021: 46). And finally, a unique deposit was found in Burial 10 in Structure 5D-34, Tikal, Guatemala, location of the resting place of an Early Classic ruler Yax Nuun Ayiin I (Coe 1990). It is a particularly interesting case because of the number and specific arrangement of turtle shells found there. Five turtle shells, arranged from the biggest to the smallest, were placed on a wooden frame, three large ones on the top of the frame, and two smaller ones probably at the bottom. It may have been used as the first Mesoamerican marimba-type instrument (Brill 2012) or gong rack.

Several burials from the Late Classic Period also contained turtle shells. A burial from Structure B118, Caracol, Belize, contained a shell with perforations (Teeter 2001: 128). Among the rich assemblage of Tomb 1, Copan, Honduras, were decorated vases, jade, shell and obsidian objects, two incised peccary skulls, a pottery whistle, a deer bone, and a turtle carapace (Longyear 1955: 140–41). Moreover, at Copan, Mound 36 – labeled by the excavators as a midden and burial struc-

ture – was a turtle shell placed with unworked deer antlers (*ibid*: 112). An almost whole turtle shell was found in Mayapan, Postclassic Burial 14, with holes in both parts of the shell drilled in the central axis, along with fragments of deer antlers (Hamblin 1980: 135; Pollock et al. 1962).

An exceptional context of a turtle shell finding is the Palace Reservoir in Cancuen – a water reservoir located near the royal palace of the site, that was used during the Late Classic Period (Thornton and Demarest 2019). Excavations revealed that the palace was the final resting place of at least 31 elite individuals of both sexes, most of whom showed evidence of trauma (*ibid*. 476). This mass grave is dated to around 800 CE, when the site went through a turbulent period leading to its eventual abandonment. The reservoir proved to be rich in artifacts connected with rituals of the Classic Maya elites, likely conducted prior to the final deposition of human remains. Among the artifacts and faunal remains were four turtle shells, two of them with abrasions in the center of the plastron. Additionally, deer antlers with polished tips were found in the same assemblage. The findings also included other musical instruments: a rasp made from a deer tibia, a shell trumpet, and figurine-whistles (Sears 2016; Thornton and Demarest 2019). Another watery deposit is known from Dzibilchaltun, where a turtle shell, was found in the *Xlacah* Cenote, and its entire shell was "covered with scratch marks" (Wyllys Andrews IV and Wyllys Andrews V 1980: 328).

4 Sound of thunder – interpretations and discussion

The interpretation that the sound of the turtle shell idiophone is connected to thunder was proposed by Seler (1990) and later developed in Taube's research of God N as a god related to turtles and thunder (Taube 1992: 99). The further implication was that it was used in rituals based on sympathetic magic as a mechanism for summoning rain through the replication of the sound of rain and storm (Reents-Budet 1994; Quenon and Le Fort 1997; Zender 2006). This kind of rain-summoning ritual is said to be represented on San Bartolo murals, depicting the Preclassic version of the Maize God resurrection, and on the Classic vase K731 (Zender 2006: 9). In the Preclassic scene, the Maize God, needing to escape the Underworld, plays the instrument to summon the rain. The surface of the Earth is represented by a turtle carapace, which resembles an enclosure of dry soil. The Maize God succeeds in his goal with the aid of Chaak. It is interesting how the two ideas may be connected – a turtle shell which in the resurrection context represents a "milpa after a period of prolonged, dry-season drought: a dried and hardened surface" (*ibid.*: 10) and the turtle shell idiophone, which helps to bring the rain ending the dry season. Taube (2009: 48) noted that "the natural act of lightning striking the earth is music-making on a cosmic scale, with thunder resounding from the carapace of the earth turtle". In this case, hitting the turtle shell idiophone would replicate hitting the earth by lightning. Below I discuss this interpretation.

Thunder as a meteorological event is one of the first signs of the rainy season in Maya Lowlands. It was described by Redfield and Villa Rojas during ethnographic research in the Maya village, Chan Kom, in north central part of Yucatan Peninsula:

> "The people scan the eastern sky, for there all the chaacs are gathered, ready to ride forth with the fructifying waters. At last, one day the clouds gather in the east, and the first low thunders of the season are heard. This is a welcome sound; now the rains will come within a very few days; when this first thunder rumbles, the men shout, He cutalo le yum chaacob! (Here come the lords chaac!). Soon the gathering clouds sweep westward, spreading across the heavens; the chaacs are riding the sky and the first rains fall."
>
> (Redfield and Villa Rojas 1962: 84)

Similarly, among Lacandon Maya, the god of thunder, called *Tanepekqu*, also announces the rain (Tozzer 1907: 98).

The notion of caves inhabited by otherwordly, usually dangerous beings connected with the watery, "meteorological" realm (including thunder, lightning, clouds, rain, and dangerous atmospheric phenomena) appears commonly in the ethnographic record (Vogt and Stuart 2005: 177; Ishihara 2007: 29). Researchers also noted contemporary Maya beliefs indicating clouds and rains as coming from caves by means of the wind. This may be based on observations of the phenomenon of clouds of mist rising from caves (Ishihara 2007; 2008; 2013). If these beliefs stretch back to the Classic Period, many of the artifacts found in caves could have been leftovers of rituals invoking rain, or been offerings to the gods of rain, lightning, and thunder. Based on the logic of sympathetic magic, smoke from copal incense was thus imitating clouds, and musical instruments were imitating the sound of the storms. Ishihara interprets ceramic drums found in Grieta Principal, Aguateca, Guatemala, as possibly used to symbolically replicate thunder (Ishihara 2007: 353). A similar interpretation is attributed to the ceramic drum from Actun Chanona, a cave in Belize (Peterson 2003: 31). There is also linguistic evidence for using drumming as an imitation of thunder sounds; the contemporary Yucatec word *pec* means both "drum" and "the noise of the thunder" (*ibid*.).

The sound of a drum as a means for conjuring a thunderstorm appears in modern Ch'orti myths as well. The maize myth hero *Kumix* finds out that his father was killed and his inheritance stolen – an inheritance comprised of objects, which, depending on the version of the narrative, include a whip, a drum, clothes (which were the clouds), or a machete, drum and a gourd. When *Kumix* recovers his father's belongings, he uses them to produce lightning, thunder, and rain (Chinchilla Mazariegos 2017: 187). Each object is thus used to imitate one natural phenomenon: the machete provides a visual symbol (sparkle-lightning), the whip provides a visual and auditory symbol (the crack of the whip and the cloud of misty vapor resembling the effects of lightning striking), the drum – an auditory symbol (drumming-thunder) – and the gourd can be filled with water and stand as a *pars pro toto* metaphor of rain (clothes-clouds also are used to make rain). This myth seems to be realized in the ritual invocation of rain performed at Chan Kom, in a ceremony which is presided over by the ritual specialist called *-h-men*, who selects an old man to impersonate *kunku-chaac* – the chief of the rain gods. He receives a gourd and a wooden machete – the attributes of a rain god. He uses his voice to imitate thunder, with the machete symbolizing lightning (Redfield

and Villa Rojas 1962: 142). Sosa's ethnographic research conducted in the Yalcoba town in Yucatan provided a similar example: "Then during some of the prayers, they would imitate thunder and rainfall by banging pieces of wood together and splashing water on the *ka'an ce'* and participants, and thus lent a dramatic air to the *hmeen's* performance" (Sosa 1985: 387).

The objects mentioned in myths and used in the rituals can be compared to the ones depicted on vase K731. There, Chaak, with a stone, may be producing lightning, and the turtle shell may be a symbol of thunder, while the Maize God is holding a gourd filled with water and maize seeds (Chinchilla Mazariegos 2017: 221).

Taube noticed also that a rattle staff – an idiophone with one or more resonating chambers filled with pellets – could have produced sounds symbolizing the sound of the thunder (Taube 1989). The rattle staff is topped with a serpent in some Postclassic depictions, and the serpent was the symbol of lightning.[14] In the Chan Kom village, where thunder and rain are believed to be connected with lords chaaks, there are different chaaks responsible for different aspects of a thunderstorm, among them *bohol-'caan-chaak,* which means "gourd rattle chaak", who produces much thunder and little rain (Redfield and Villa Rojas 1962: 115). Finally, the sound of a conch shell trumpet used in the *K'ichean'* serpent dance is another sound supposedly imitating thunder (Taube 1989).

Since contemporary Maya use a range of visual and auditory metaphors to reenact the mythological narrative and imitate nature in rituals, it is also possible that this was true of the Classic Period. I believe that the sound of the turtle shell idiophone could have symbolized the sound of thunder, especially in the Classic Period. However, ethnographic sources provide evidence that drums, rattles, the human voice, or conch shell trumpets could also have been used in the same manner. It seems that in the Maya culture(s), the formal specifics of the instrument were not the most important factor, but rather the context of the sound production and its relations to other metaphors used in the mythical narration or ritual influenced its symbolic values.

5 Other symbolical associations of the turtle shell idiophone

It is worth noting that, in mythological depictions, playing the turtle shell is connected with the moment before the Maize God's rebirth. This fits a rain-summoning interpretation, but also provides another, related understanding. On the San Bartolo mural, the Maize God plays the instrument while inside the turtle, yet the image is flanked by renditions of his death and birth. Thus, it may be that being inside the floating turtle is the moment in-between, a moment of journey and growth.[15] On vase K731 and the vase from Copan discussed previously the Paddler is found playing

[14] This type of idiophone is also called a "thunder-staff" by the contemporary Sierra Totonac (Taube 1989: 124).

[15] The motif of turtles bringing help, refuge and accompanying the moments of transition of the Maize Hero appears in modern myths and stories – Homshuk, hero of Popoluca, uses the turtle to go across the sea in search of his parents. When he reaches the land, he plays musical instruments like a drum, a turtle shell idiophone, and a flute (Chinchilla Mazariegos 2017: 188). In Q'eqchi' version of Hummingbird myth, the old deity related to the forest (called Earth Lord) has a daughter (identified with a moon), who is seduced by a

the instrument, and in the first image of this corpus, the Paddler is located in front of the resurrected Maize God. It does not automatically follow, however, that the Paddlers and the Maize God emerging from the turtle shell are engaged in the same episode of the story. Paddlers are usually depicted as beings who guide the Maize God through the watery Underworld, a metaphor for death. It was not uncommon in Maya art to employ narrative compression and combine elements from different stages of a story in one continuous scene. If this is true for vase K731, the music of the turtle shell would be connected with the death and journey of the Maize God. The instrument made of the aquatic animal was played during his passage through a watery Underworld in a canoe or inside the turtle. This observation seems significant in light of the findings of turtle shell idiophones in burials and watery deposits (Cancuen Palace Reservoir and Cenote Xlacah in Dzibilchaltun). Zalaquette (2021: 71) has already noticed, that the turtle shell found in burials may be a symbol of rebirth. These two contexts, archaeological and iconographic, are complementary in relating the turtle shell idiophone with the watery Underworld, the passage towards rebirth.

6 Conclusions

The majority of iconographic and archaeological sources confirm that the shell of a turtle was used as a resonating instrument by the Maya. There are three depictions of the turtle shell idiophone where it has an additional spherical bowl attached to the bottom, which could have been an additional resonator made of gourd or ceramic. However, such a modification has not been yet confirmed in the archaeological record. On two vases (K3041, K5104), the turtle shell is marked with a *k'an* cross, while on vase K731, this sign appears on the attached bowl. The use of this sign on a turtle shell idiophone may be a reference to the yellow color of the object, while on the other hand, it connects the instrument to other depictions of turtles in Maya art. The size of the turtle shell idiophone represented in Maya art is large, usually the same size as the torso of an adult male musician, suggesting the use of the *Dermatemys mawii* species, measuring up to 60 cm.

The visual sources clearly indicate that the turtle shell was held under the arm and beaten on the side of the plastron. There is not enough archaeological evidence of the use-wear marks on the plastron to assess which parts of the plastron were hit most often and if the Maya musicians benefited from the two-toned potential of the instrument. Deer antlers as solid objects used for beating the shell were commonly depicted, and there are also rare cases of antlers found alongside turtle shells in the same deposit. One depiction of a turtle shell being struck with a stick is represented in the figurine from Copan, while on vase K5506 a very small shell is struck with a long bone.

Supernatural musicians playing turtle shell idiophones are depicted in the context of the Maize God's journey through the watery Underworld and his resurrection. In such cases, the instrument was played solo by the Stringray Paddler (K731) or the Maize God himself (San Bartolo murals). Another supernatural character playing this idiophone is the duck-billed wind god or his

young hunter (identified with a sun). After he succeeded, the couple escaped in a turtle carapace, or on a crab or armadillo (Looper 2019: 78).

impersonator. On vase K530, the percussion trio made up of characters with Chaak's features accompanies an enema scene taking place in the Underworld. In the sky realm, a similar ensemble, this time comprised of old musicians is depicted on vase K3007. In both scenes, the band is located on the edge of the composition, and these ensembles are visually unified by their similar clothing.

The Chamá-vase scenes represent an ensemble of characters, who may be humans dressed in zoomorphic costumes, operating in the liminal space between the real and supernatural world. The figurine of a musician (Copan, after Zalaquette 2021: fig. 20) with distorted skin, highlighted by dimples around the chin and cheeks, is similar to representations of other individuals with deformations playing instruments (for example the drummer on figurine K5785 and rattle player on the vase K1507). Other musicians playing this instrument have human features; although none have name tags preserved (although it is possible that the musician depicted on the polychrome drum from La Ruta Foundation may have had a name tag that has since eroded: Krempel and Paredes Maury 2017).

Events where a turtle shell idiophone was employed took place in both interior private and exterior public spaces, though many scenes do not have clear markers of location. The activities performed with the accompaniment of a musical ensemble with turtle shells included dances, processions, and human sacrifice. Regarding the interpretations of the symbolic functions of the turtle shell idiophone, its sound could have been used as the sound of thunder in the imitative magical ritual of rain summoning. However, this imitative function was likely dictated by the mythological or ritual context of its use, and other sounds performed in such contexts could have had an analogous role. In Classic Period iconographic sources, the turtle shell idiophone is associated with the Maize God's journey from the watery Underworld, ending with his rebirth. This part of the mythological narration also neatly corresponds with the rain summoning, as the start of the rainy season brings the maize back to life. Taking into consideration that the turtle shell idiophone was placed in burials, it likely served as a sound object during the passage towards rebirth, mirroring its use by the Maize God. Therefore, the use of this musical instrument serves as an example of how the sphere of agricultural rituals and beliefs concerning the afterlife were interconnected in the Maya culture of the Classic Period.

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