This thesis is dedicated to my family and friends. Thank for your never ending support and encouragement throughout this process.

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Drew University

College of Liberal Arts

The Scientific Analysis, Reconstruction and Cross Cultural Comparison of Human Trophy Items from the Americas

A Thesis in Anthropology

By

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Abstract

The modification of human body parts into trophy items is a practice common across the ancient world. They have been recovered in the Americas from the Northeast Coast to the Andes. The form of processing and functional significance of each item varies. The most commonly known are symbolic, associated with ritual sacrifice or warfare, although human trophy items have also been recorded in ancestor veneration and legitimacy of the ruling class. The item that motivated this study is an *omechicahauxtli*, an object specific to Mexico that refers to a musical rasp. This thesis reports on an *omechicahuaxtli* recovered from a Postclassic shaft and chamber tomb in Jalisco. Artistic representations of rasps are known from this region. To date, this appears to be the only West Mexican *omechicahuaxtli* recovered from an archaeological excavation and systematically analyzed. The rasp is broken, possibly assisted by a sacrificial 'death' prior to interment. The comparison of this object to other notched musical instruments from the region demonstrated that this rasp was unique in that it presented with wear patina at higher levels than other rasps. At least 23 notches are visible with varying distance, depth and polish. Microscopic analysis of the notches was undertaken to examine how the musical rasp was manufactured and used. This analysis identified tool striations and extensive wear patina, demonstrating the rasp was not just a symbolic object, but had extensive use prior to inclusion in the funerary context, thus providing insight into prehistoric ritual world of West Mexico.

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Introduction

1-1: Human Trophy Items

The creation, utilization and display of human trophy items are a phenomenon found in nearly every culture around the world. For thousands of years people have been practicing the taking of body parts because of their significance and symbolism. Trophy items can appear in a variety of forms and can be taken for several different reasons, but this instance refers to any part of the human body that has been modified for warfare, mortuary, societal or ritualistic purposes (Chacon and Dye 2007). In the region of Mesoamerica, such items include complete heads, maxillae and mandibles processed so as to hang from the body, scepters created from long bones and instruments made from long bones or from the skin of sacrifice victims (Fowler 1984; Carrasco 1995; Herring 1995-96; Mock 1988; Spence et al. 2004; McVicker 2005; Pereira 2005; Berryman 2007; Evans 2008; Duncan et al. 2009).

1-2: Omechicahauxtli

One such human trophy instrument, a rasp regionally known as an *omechicahauxtli*, was recovered from the archaeological cemetery site of La Contingencia. The site, Jalisco, Mexico, dates to the Postclassic Period (900-1200 CE). Other musical instruments such as this have been recovered from sites dating from as early as the Preclassic Period in West Mexico (1500 BCE- 250 CE) up into the Postclassic Period (900 CE- 1521 CE) (McVicker 2005; Pereira 2005).

An *omechicahauxtli* is an incised long bone that is rhythmically played by dragging shell or bone across the notches (McVicker 2005; Pereira 2005). The instrument in question, pictured in Figure 1 presented with signs of heavy wear along the entire anterior surface where the notches occurred, a feature not readily seen on other *omechicahauxtli* recovered from this region, such as those pictured in Figure 2 (Turner and Turner 1999).

Figure 1. *Omechicahauxtli*, musical rasp carved from a human femur, recovered from the site of La Contingencia, Jalisco, Mexico (Image by J. Rhodes).

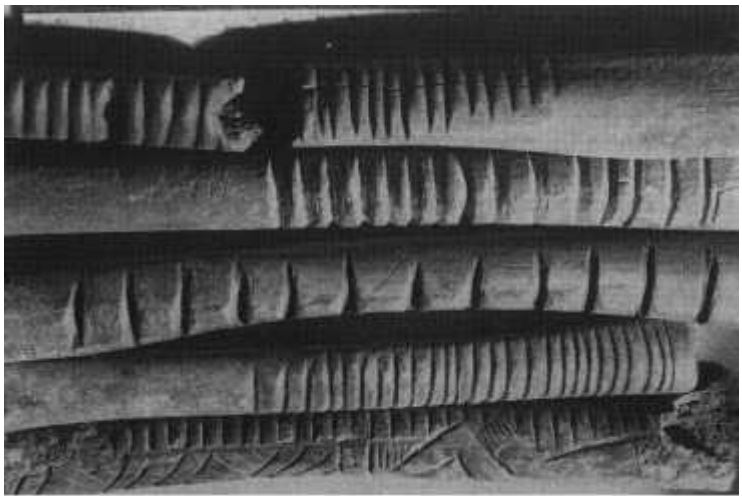

Figure 2. Carved *omechicahauxtli* from human long bones from the Federico Solórzano Barreto Collection, Zápopan-Guadalajara, Jalisco (Turner and Turner 1999).

This region of Mesoamerica has a long cultural history. Archaeological research and ethnohistoric accounts provide evidence that for close to 3000 years before the Spanish arrived, the region was home to a wide array of cultures and major centers. All of the groups residing in the area had shared values in regards to life, death, funerary rituals, resurrection, and fertility. Common among this area was the belief in the deity Quetzalcoatl, a god responsible for the recreation of mankind. Ethnohistoric accounts from the region discuss the myths about the god and archaeological sites present with iconographic images of him and ceremonies dedicated to his worship. The myth surrounding the god states that Quetzalcoatl descended into the underworld to collect the bones of humankind after they were destroyed at the end of the previous world. While there, Quetzalcoatl encounters the lord of death who frightens him into dropping the bones which break. Quetzalcoatl is able to collect the broken bones and flee to the surface where he takes them to the earth goddess who is able to recreate mankind from them. The notched long bones recovered from this region were meant to symbolize the bones that Quetzalcoatl brought back from the underworld, and were notched and played during a ritual resurrection ceremony (McVicker 2005).

Studies performed by McVicker demonstrate that, though there was a shared belief in Quetzalcoatl in this region, incised long bones were not the only methods used to symbolize the recreation of mankind by the deity. Among the Aztec (1350-1521 CE) symbols of Quetzalcoatl were also important in funerary rituals along with notched bones. These bones were often played for mortuary rituals of the elite. Notched long bones were also important to the Matlatzinca and Purépecha peoples of West Mexico,

both of which date to the Postclassic Period (900-1521 CE). These bones came from defeated enemies, a detail that adds to their symbolism and significance. They occur in archaeological grave sites from these groups in considerable numbers and it is believed that they symbolized Quetzalcoatl's recreation of mankind. During the rituals in which these rasps were used, "it was the 'performative' act of notching the bones that gave symbolic power to their use in funerals and as offerings in graves. In the rite of passage for the dead their value as musical instruments was secondary; of primary importance was the percussive sound produced by notching and then rasping them" (McVicker 2005: 25).

McVicker believes that not only were these rasps used in rites of passage and funeral rituals, but that they could have been used in a shamanistic context in which they referenced "warfare, hunting, death and rebirth" (2005: 19). This relates to the creation myth that exists in that the use and creation of these objects from human long bones may have been part of funerary rituals to symbolize Quetzalcoatl's recreation of mankind. These objects would have been played at funerary events and even placed in the graves as offerings (McVicker 2005).

A study by Pereira on a collection of 8 *omechicahauxtli* was performed to determine the tradition of creating notched long bones and what function/symbolism they may have held in the community. By using ethnohistoric accounts on rituals and ceremonies that were common in the region as well as use wear analysis, Pereira found that the instruments may have come from victims of sacrifice and that they were

intentionally broken before interment. His study found that these instruments had a long history of use in this region and that they varied in function and significance. The 8 notched long bones were each categorized with different stages of wear and usage, ranging from 0 with little to no evidence of playing, all the way to stage 3 which is characterized by heavy wear to the bone surface. Pereira concludes that notched long bones were relatively common and would often be ritually sacrificed, symbolizing rebirth (Pereira 2005).

A number of similar rasps, featured in Figure 2, were recovered from Michoacán (600 CE- 1200 CE), a state bordering Jalisco. In the collection of Federico Solorzano Barreto are 2,000 objects that are contemporaneous to the creation the rasp from La Contingencia and therefore provides a close parallel in terms of use and significance. The artifacts in the collection include the rasps as well as daggers, awls, barbed points, and a number of other utilitarian objects created from human long bones. The creation of these artifacts may have followed the ritual sacrifice of victims and consumption of their flesh. Studies performed on these objects reveal the importance of human sacrifice in the region of West Mexico and that parts of the bodies of sacrifice victims were utilized (Turner and Turner 1999). The instruments featured in Figure 2 are very similar to the *omechicahauxtli* that is the basis of this study, except that they do not present with the characteristic bone changes presumably created from extensive playing. It is important to note the variation in notch intervals and the variation in where on the shaft the notches are located. Some of the instruments pictured above do present with the rounding to the

edges of the sections between incisions, however, this is variable and not as extensive or across the length of the instrument as seen in the La Contingencia rasp.

The goal of the project is to analyze and verify the apparently unique characteristics of this artifact; the use wear on this human trophy item and, through comparison with other such items, to see if commonalities exist which could aid in reconstructing the significance and usage of this particular item. This project combines the physical osteological analysis of the *omechicahauxtli* while also including a comparison of other such objects and iconographic depictions of human trophy items from across the Americas. The instrument in question is analyzed for cut marks and wear patina to inform on how much the object was used. Measurements are analyzed in order to determine whether or not there was any consistent pattern in carving the instrument. An *omechicahauxtli*, recreated using a pig femur and period accurate tools, is then analyzed to determine the difficulty involved in carving and playing the rasp. Finally the varying evidence of human trophy taking from across the Americas is examined to determine if there are any underlying commonalities in the creation and utilization of human trophy items. This research situates this object in the larger context of human trophy taking and will inform on the apparent unique characteristics of this instrument in terms of use wear. It will also provide insight into the social/political world of the Ancient Americas by discussing the significance behind such objects and whether it was militarism and/or ideology that motivated the taking of human trophies and how this may relate to the La Contingencia rasp.

Materials and Methods

2-1: Archaeological Context

The *omechicahauxtli* was recovered from a looted shaft and chamber tomb in Jalisco. Shaft and chamber tombs are a burial method common to this area and are simply tombs that have a long vertical shaft that attach to a larger room where the dead are laid to rest (Evans 2008). Studies performed in the area on social complexity indicate that these tombs are indicative of social status and differences (Beekman 2010). Although this is disputed by some, osteological analyses coupled with the mortuary context indicate that among smaller cemetery sites, such as La Contingencia, there is seasonality to burial. Each of the tombs at these sites is representative of the individuals who died at during the previous year (Rhodes and Mountjoy 2012).

The rasp was recovered on its own in a pile of dirt removed from the tomb while the looters were digging. The instrument originates from one of the tombs at this site, but a specific individual or grave cannot be identified. Also present in the same pile of dirt as the bone fragments were small sherds of pottery. This indicates that the tomb may have contained ornate pottery, also indicating a higher status individual, but these would have been taken by the looters. The small samples of pottery sherds recovered aided in dating the tomb by comparing pottery styles and designs to a previous established chronology (Joseph Mountjoy pers. comm.) In comparison of the sherds to this chronology, the pottery from this tomb likely dates the site to the time period of the Aztatlán people.

Also of note is that no other skeletal remains were recovered from this tomb which is unusual for a looted grave. When most tombs are looted, any material of value is taken, but human remains will usually be found in a pile of dirt associated with a grave. This is an important feature that may indicate the burial of the rasp on its own

2-2: Postclassic Aztatlán

Pottery sherds recovered from the back dirt can be sequenced to the Post-classic period (ca. 900-1200 CE). If these ceramics were entombed with the rasp, this would indicate that the rasp also originates from this time period. During the Post-classic period, the region was occupied by the Aztatlán people (Townsend 1992; Evans 2008). Examination of the pottery styles found at Aztatlán sites, as well as other archaeological materials, indicates that this society was a part of a larger trade network that extended up the coast into parts of California. The styles of pottery recovered are very similar to those found among groups located farther north, demonstrating the influence of trade. Trade was a key component of the economy of the Aztatlán. They were strategically located in a river valley and were close enough to the coast that they were in the position to accept trade going up and down the coast while also receiving farm goods, metals, and obsidian from farther inland. Their trade was so effective that it helped to revitalize areas of Mexico farther inland after the fall of several major centers (Evans 2008). Though there is information on the subsistence strategies of the Aztatlán, no studies exist on their use of human trophy items.

2-3: Measurements

The rasp, made from a human femur, was recovered in eight fragments that varied in shape, size and number of incisions. Neither the proximal nor the distal epiphyseal surfaces were preserved. The absence of proximal and distal most ends of the femur prevented further examination of decoration or modification. All incised notches occurred on the anterior surface of the femur were analyzed in order from the distal most incision (towards the knee) up to the proximal end (towards the hip joint). Each of the fragments received its own identifying number as did each notch.

In order to determine measurements two different sets of measurements were taken using standard osteological equipment. Measurements were taken to determine the depth of each incision and the length of the sections between each incision to determine if there were any consistencies that the original carver intended, possibly indicating a symbolism in measurements. If there were consistencies in the measurements, then the reconstructed musical rasp would have been carved to these dimensions.

2-4: Microscopy: Dino-Lite Digital Microscope

In order to better understand the changes to the surface of the *omechicahauxtli*, a Dino-Lite Digital Microscope, model AM413ZTAS, was used. The handheld microscope allows the individual operating the microscope to zoom in up to 145 times magnification to better see surface features on bones that would not be visible to the naked eye. For this study, the Dino-Lite Digital Microscope was used to see the wear patina, the curvature

caused by playing and the incision markings at a better magnification in order to aid in determining the usage of the instrument.

2-5: Microscopy: Scanning Electron Microscope

Casts were made of the notched incisions using President Jet vinyl polisiloxane impression material. This casting material preserved surface features of the instrument for later analysis under a scanning electron microscope, or SEM.

There are a number of advantages to using an SEM. It allows one to see the surface of a sample in greater detail. During microscopy the sample, in this case the casts that were made, are scanned with a beam of electrons which interact with the atoms of the sample and bounce off. The microscope measures the electrons bouncing off in order to give information on the structure of the sample in the form of a three dimensional image (Alberts et al. 2002).

Before the casts could be analyzed under the SEM, they had to first be prepared. The casts were mounted on metal stands by using Palmers liquid cement. The surfaces of the casts were then coated with a thin layer of gold that conducts electricity (Hearle, Sparrow and Cross 1972; Alberts et al. 2002). After this step, the casts were put under the microscope and images were captured of the incisions and the wear patina.

2-6: Experimental Studies

Experimental carving and playing was performed on pig femurs in order to determine the amount of motivation and intent, the time it takes to create an

omechicahauxtli, and the time it takes to create the bone change present on the La Contingencia instrument. The femurs used in the study were initially processed by a butcher, but a lot of material still remained on the bone. The bones were cleaned; any remaining flesh, tendons, muscles, and cartilage were removed, and then the bones were prepared for processing. The bones were dried for four days in order for any material in the marrow cavity to leak out and for the cortical bone to dry so as to create a better carving surface. The distal ends of the femurs were then removed using a bone saw and the marrow cavity was further cleaned. The instrument was then carved using period accurate tools that were created through the process of flintknapping. Incisions were created and the instrument was played with a shell implement for four hours to recreate wear patina on the playing surface.

2-7: Cross Cultural Comparison

The region of Mesoamerica is the most relevant area to the discussion of human trophy items in reference to the *omechicahauxtli*. While *omechichahauxtli* are largely a regional, West Mexican phenomenon, they are better understood within a broader context of Mesoamerica. The region of West Mexico was neighbors with but never occupied by the Maya (predating the La Contingencia rasp) or the Aztecs (postdating the La Contingencia rasp). However, it is reasonable to examine these in the broader context of Mesoamerican civilizations considering the close contacts and regional trade networks that likely existed. This region will provide more information and local reasoning for the taking of human trophy items as well as provide what will be the closest evidence

supporting the creation and symbolic importance of human trophy items which will then relate to the ideology behind the La Contingencia rasp.

Of note is the fact that human sacrifice played a very important role in Mesoamerica (Boone 1984; Demarest 1984; Berryman 2007). Not only is there physical evidence from this region, in the form of human remains, but there is also ample iconographic evidence, much of it depicting scenes of interpersonal violence (Berryman 2007). Though some question whether the many images that depict sacrifice are an indication of actual sacrifice or "representations of mythic" events, it is evident that the ideology behind sacrifice played an important role among groups of this region (Berryman 2007:377). It is integral to view human trophy items in the larger framework of sacrifice because the two events often go hand in hand in this region.

The two cultural groups that provide the closest parallels in terms of the practice of human trophy taking and the motivation behind it are the Maya (250 BCE-1000 CE) and the Aztecs (1350 CE-1521 CE). Figure 3 below demonstrates the boundaries of each of these empires in relation to the site in Jalisco, which is marked by a star. The Maya, who are neighbors to the region of West Mexico, directly preceded the Aztatlán while the Aztecs come directly after and are known to incorporate the polities and belief systems of conquered peoples into their own culture in order to maintain control (Hassig 1995). It is possible that the practices and traditions of the Maya carried on into this area or that the practices and traditions of the Aztecs incorporated those of the Aztatlán.

Figure 3. Map of Mexico with Aztec and Mayan Empire. The star marks the site in Jalisco where the instrument was recovered from.

Among the Maya, the driving source behind the taking of trophy items appears to be ideological. Though there is evidence of violence and conflict throughout the region, warfare was not the primary motivation for the taking of human trophy items. In looking at the archaeological evidence from this area, early cities lacked the fortifications required for groups to survive in an area under constant threat of large-scale warfare. Instead, small scale raids into other territories were performed in order to take captives for sacrifice. This need for captives for sacrifice is motivated by the origin myth of the Mayans, the *Popul Vuh*. The myth states that the two brothers, the hero twins, descended into the underworld to play the ball game against the lords of death. Eventually, the brothers trick the lords of death into allowing themselves to be sacrificed by means of

decapitation. After the lords of death were defeated, the twins resurrect their father, the Maize God, who had been killed by the lords of death by decapitation (Berryman 2007).

When a new heir was born or a ruler had died, those of the elite class would demand the sacrifice of many victims, thus motivating the raids on other groups in order to acquire the number of captives necessary for ritual sacrifice. Those that were sacrificed served as a reenactment of the mythical events of the *Popul Vuh*. Often, some of the captives that were taken by the Mayans were forced to reenact the ball game, after which they were decapitated as a symbolic victory over the lords of death and the rebirth of the Maize God. The act of sacrifice and the display of the body parts, either in public places or on the body, of these sacrificial victims not only served as a means of reenacting the mythical events of the *Popul Vuh*, but also served as a way to legitimate the ruling class while also acting as a display of political power and elite status, thereby intimidating other local rulers. Throughout the region, there is ample archaeological evidence in support of human trophy taking and sacrifice as well as iconographic evidence, especially depictions of decapitated heads, reflects the ideology that this group had regarding these items (Berryman 2007).

One such site that presents with physical evidence for mass sacrificial burials and human trophy taking can be found as early as the Preclassic Period (1000 BCE- 400 CE) in Guatemala. At the site of Los Mangales, three elaborate burial mounds were recovered that contains evidence of sacrifice. The oldest burial at the site contains the remains of one adult male surrounded by a dozen partially dismembered sets of human remains as

well as 3 trophy heads. Of the other two burials at the site, one contained two trophy heads and the other contained eight. All three burials contained individuals of importance, evident from the number of human sacrifices and grave goods. Little research has been done on the trophy heads from this site, but it is one of the earliest sites in the Maya region to present with the use and display of human trophy item (Berryman 2007). Because of the sites location in the Maya region, the trophy heads may have been a symbolic reenactment of the mythical events of the *Popul Vuh* and may have served as signs of the elite status of the individuals buried with them.

Evidence of trophy taking and ritual sacrifice among the Maya also comes from a Late Preclassic Period site (250 BCE- 250 CE) in El Salvador. At the site of El Chalchuapa, an archaeological investigation uncovered 33 adult remains, 21 of which were confirmed to be adult males. Evidence for human sacrifice and trophy taking comes in a number of forms; many of the victims had their ankles and wrists positioned close together, suggesting that they were bound together at time of interment, there were several isolated crania found, suggesting trophy heads, one of the sacrifice victims was missing a head, two of the individuals had been cut in half at their waist at the time of interment, one individual had both of their lower legs removed while another had both feet cut off. This, coupled with the obvious lack of grave goods, the careless positioning of the bodies, and the age assessment putting all the male individuals in their prime of life suggests that these were all war captives that were ritually sacrificed, perhaps as a sign of rebirth. The primary individual that was interred at the site would have been a member of the elite class. The sacrifice of so many captives, their dismemberment, and the

inclusions of human trophies would have served as a symbol of rebirth of the individual (Fowler 1984; Berryman 2007).

A specific example of a human trophy item, recovered from the Maya city of Xcalumkin, further supports the ideology of the Mayans regarding human trophies. The item was created from a right human femur (see Figure 4) and, like the *omechicahauxtli*, was taken from a victim, processed, and then manufactured for a specific use. Carved onto the surface of the femur is a "standing male figure…in ceremonial regalia. He wears a skeletal zoomorph headdress trimmed with cut and uncut feathers, face-like ahaw (lord) symbols, disembodied eyeballs, and foliated elements…The appearance of the standing figure on this carved bone does, however, make clear reference to rituals of spiritual transformation and vision" (Herring 1995-96: 57). Herring then goes on to discuss the art historical significance of this object and how it is consistent with the pictorial and hieroglyphic style of the Mayan.

Figure 4. Carved human femur from the Maya Site at Xcalumkin (Herring 1995-96).

One thing that is missing from the analysis of this, however, is an osteological investigation. There are no comments made on what sex or age the victim may have been or where they would have come from, something that Herring himself comments on. He does go on to speculate about the objects use, however, stating that it may have been used as a noble or ceremonial scepter or as costume ornamentation, a custom that can be seen on many iconographic representations from around the area. Herring believes that the

imagery on the ruler (the zoomorphic headdress and the eyeballs) all relate to the notion of sacrifice and vision because of their association with death (Herring 1995-96). This interpretation is supported by the aforementioned evidence regarding the taking of captives for sacrifice. The objects association with death is also in line with the ideology of the region because the victim it came with would have been sacrificed to symbolize the rebirth of the Maize God and the death of the lords of the underworld.

For the Aztec groups of Mesoamerica (1350 CE-1521 CE), the driving force behind the taking of trophy items was militaristic. In order to maintain control over a large area, the Aztecs not only used force through warfare, but used pervasive means of control. After conquering an area, the Aztec ruler would not place a trusted member of his elite in control of the area, but instead opted to let the local people control their government. The leader would also incorporate religious beliefs and ideologies of the people they conquered into their own belief systems, which suggest that the use and significance of the La Contingencia rasp may have carried over into the Aztec tradition. By incorporating the belief systems and traditions of conquered people into their own, the Aztec rulers lessened the likelihood of a rebellion against imperial power, but this also meant that there needed to be some incentive in place to maintain that control (Hassig 1995).

In order to maintain the semblance of power and control, Aztec rulers would use sacrificial victims and trophy taking as a sign on militaristic power. Yearly, military campaigns would be organized in which the Aztec armies would conquer surrounding

lands, taking captives in the process. The Aztecs would often gather the leaders of conquered areas in major cities where they would then sacrifice the captives taken in war. Demonstrations of power such as this would serve as a reinforcement of the Aztec leaders strength and power and would dissuade and of the local leaders from rebelling (Hassig 1995).

The tradition of creating musical rasps, as well as other instruments, was present in the Aztec time period. In the collection of the American Museum of Natural History are a number of rasps from the Aztecs. The rasp would be rhythmically played with a stick implement and did have ceremonial significance, but more importantly, objects such as this symbolized a warrior's strength and military prowess. After defeating their enemies and taking them captive, Aztec warriors would participate in ritualistic cannibalism. In an attempt to literally consume the strength of the defeated enemy, Aztec warriors would consume flesh from the thigh of their victim, the place where an individual's power was believed to be stored. The femur was also known to be used in funeral rituals of deceased warriors and would have ritually played. Among earlier Mesoamerican populations, the significance of the human bone rasp had a different significance in that it was used for ritualistic purposes. Among the Aztecs, a population known for their violent conflicts with outside groups, this form of trophy taking was a method used to display power and skill in warfare (Feinman et al. 2010; AMNH 2014).

Many Aztec sites present with physical evidence of captive sacrifice and trophy taking. Recovered at many of their sites are *tzompantli*, or skull racks containing the

decapitated heads of sacrifice victims taken in warfare as seen in Figure 5. Literal and figural walls of human heads of sacrifice victims were common throughout the Aztec world. These walls would serve as an enforcement of imperial power and would intimidate any would be usurpers. Though *tzompantli* were used before the Aztec empire came to power, they occur at a greater frequency during the Aztec time period. These skull racks would serves as visual reminders of the king's power and military might (Mendoza 2007).

Figure 5. Bas-relief panel from the *huey tzompantli* at Chichen Itza, Mexico depicting human crania impaled on sticks (Mendoza 2007).

Human trophies and sacrifice not only served a militaristic purpose in the region, but also served an ideological function. First person accounts from Spanish Conquistadors reflect the nature of Aztec sacrifice at time of contact. Because the Aztecs would incorporate the belief systems of conquered people into their own, the Aztecs had

nearly constant celebrations and festivals occurring. At these celebrations, the Aztecs rulers would make blood-offerings to the gods of earth and water. It was the job of the ruler to ensure that the rains came and that the earth was revitalized and, by sacrificing to the gods of earth and water, he would ensure renewal of nature (Townsend 1992).

This practice was also seen in the taking of complete skins from victims in honor of the god Xipe Totec. Xipe Totec, or the flayed skin god, was an important god in the Aztec pantheon. He was a god of life-death-and rebirth and therefore had an association with agriculture, disease and fertility. In order to bring in a fertile season, shamans would hold a special ceremony for the god in which victims would be sacrificed to him. The complete skins of victims would be removed through flaying and then worn by the shaman or priest who would proceed to move about the town and engage in mock battles. Not only is there physical evidence of this, in the form of human skins in jars, but also artistic representations. Figure 6 below depicts one such representation of the god wearing the skin of one of the sacrificial victims (Carrasco 1995; Evans 2008). The use of human skins among the Aztecs served a ritualistic function and relates to other examples in which human trophies were used in rebirth/resurrection rituals.

Figure 6. Clay figure of Xipe Totec, Aztec flayed god (Evans 2008). The god is depicting the skin of a sacrificial victim.

Studies performed at other sites in Mesoamerica reveal that the Mayans and the Aztecs were not the only societies to practice trophy taking. At the site Teotihuacan site of the Feathered Serpent Pyramid (ca. 200 CE) located in the Basin of Mexico, graves containing the remains of soldiers adorned with human trophy items were discovered. Beneath and just outside of the pyramid were a series of graves that contained the remains of over 200 individuals. The soldiers were recovered with real and imitation mandibles and maxillae that were modified to hang from the body.

Also of note is the iconography depicted on the pyramid and how that may relate to the presence of the sacrifice victims. The pyramid depicts scenes with representations of the creation myth, the origin of time myth, calendric succession, rulership, cosmology, war and the military, all suggesting a strong ideological system of beliefs. These images, coupled with the number of warriors buried at the base of the pyramid, along with the history of militarism at the site point to an importance and revered status of the warrior class. Four of the individual recovered were wearing a combined total of 36 real human maxillae (one of these was recovered with 3 real human mandibles) while others were recovered with pendants of human teeth. The presence of these trophy items, along with rich decoration, clothing and grave goods on the remains, suggests that these individuals that were buried were elite warriors and the trophies served as indication of their military prowess. Oxygen isotope analysis of the teeth from the trophy mandibles and maxillae showed that the victims they came from were from different regions of Mesoamerica, indicating that the warriors had fought groups outside their area and were successful. This evidence demonstrates the level at which groups in the region of Mesoamerica were in conflict with outside groups, a feature that exacerbates trophy taking in general (Spence et al. 2004).

Directly contrasting the militaristic use of human femur bones among the Aztecs and the ideological use of femurs by earlier groups is the use of the human femur as an object of ancestor veneration and as a means of legitimating ones reign. At the site of the Mitla Fortress in the Monte Alban region (c. 500 CE), a burial was excavated and it was discovered that a grave had been previously opened, a femur removed, and then the grave

resealed. There is archaeological evidence of many other graves from this region that present with extra or missing femur. Burials of warriors would include extra femora and would stand as a symbol of that individual's militaristic skill. It was found, however, that femora would often be missing from graves of the elite. It is presumed that these bones were taken by descendants of these elite rulers as a means legitimizing ones rule. At the Mitla Fortress site, a grave was excavated and an individual was recovered with an extra femur. This interred individual was of importance, evidenced by more than 500 exotic grave goods interred with him. The extra femur that was recovered from his grave depicted scenes of historical events that center around the family's genealogy. This pictorial evidence suggest that this object was used as a symbol of the interred individual right to rule as he was the descendant of revered ancestors (Feinman 2010).

In another study performed at the Zapotec site of Monte Alban in Southern Mexico (400-800 CE) a human maxilla was recovered that is believed to also be evidence of human trophy taking. The maxilla was processed and made so that it could be worn on the body, much like the trophies found at the Feathered Serpent Pyramid. An oxygen isotope analysis was also performed on the teeth from this maxilla and the results showed that the teeth came from an individual who did not live in this region of Mesoamerica. This case, like the previous example, demonstrates the high status of individual of the military class and human trophy items served as a physical example of the individual's accomplishments and military prowess while also demonstrating the impact that conflict with outside groups had in regards to trophy taking (Spence et al. 2004; Duncan et al. 2009).

Iconographic depictions of human sacrifice and trophy taking are also an important area of study because it can aid in the understanding of the acts involved. Often, symbolism and belief systems will be depicted pictorially which acts as another way to disseminate a specific message or ideology. In this region, leaders wanted to display their power in such a way as to intimidate their enemies while subsequently reassuring their followers that they were an effective political ruler. One way in which this was accomplished throughout Mesoamerica was by the public display of iconography depicting sacrifice victims, such as those seen in Figures 7 and 8, as well as high status individuals/deities wearing or displaying human trophy items. Figure 7 from Valley of San Jose Mogote site depicts a sacrificed enemy victim, locally known as a *danzante*, with their entrails hanging out of their body. The monument was placed on the floor in a corridor where people would walk over, figuratively continuing to inflict pain and disrespect on the enemy. Figure 8 depicts victims being sacrificed by a ruler. Images such as these were meant to intimidate those looking at them, while also reminding them of their ruler's military strength and power (Berryman 2007).

Figure 7. Monument 3 from San Jose Mogote (Berryman 2007).

Figure 8. Panel from a ballcourt at El Tajin, Mexico (Berryman 2007).

In the Classic Period (200AD- 900AD), there appears to be more evidence of trophy taking and human sacrifice. This time period comes directly before the La Contingencia site, therefore, parallels may exist between the rasp and trophy items

created and utilized during the Classic period in terms of traditions, use and significance. Sites from around the region of Mesoamerica present with interments with defleshed crania, large numbers of mandibles, and mutilated remains of individuals with no grave goods, indicating their role as a sacrifice (Berryman 2007). One of the best studied sites from this region is that of Colha, Belize (800-900 CE). A pit was uncovered at the site containing the heads of 30 individuals ranging in age from just six months to adult hood. The crania contain cut marks that were indicative of defleshing before interment (Mock 1998; Berryman 2007). Berryman gives three possible reasons for such a pit burial of trophy heads with the age and sex differences observed: "(1) they were sacrificed as part of a religious ceremony; (2) they were political victims treated with ritual violence; or (3) they belonged to an elite lineage that was violently disposed" (2007: 390). These trophies were meant to convey a message of power to contemporaries or to serve as an offering to the gods, a theme common in many of the examples studied from Mesoamerica (Berryman 2007).

Evidence of human trophy items and human sacrifice is also present in the archaeological record from Costa Rica (200 CE- 1500 CE). Costa Rican effigy art is very similar to Mayan effigy art (see Figure 9). Ceramic, jade, or stone disembodied heads or of figures holding decapitated heads are all popular motifs in this area and stand as a symbol of military might. Militarism tends to be associated with these heads because many of them are painted in much the same way that warriors would be painted, reflecting the importance of militarism in the region (Leibsohn 1988; Hoopes 2007). These works are meant to symbolize the return of "the victorious warriors, who carry as a

trophy the heads of their slain enemies" (Lothrop 1937: 166). Items, such as the one displayed below, demonstrate the level of intragroup violence that existed in this area and how this violence motivated the taking of trophies.

Figure 9. Mayan ceramic effigy fire-god censer holding a decapitated head (Townsend, 1992).

As one can see from the cases presented above, human sacrifice was a common occurrence throughout Mesoamerica. During ceremonies in which victims were sacrificed, their bodies would often be dismembered and ritually presented to the gods for offerings. Some believe that this was done purely for religious ideologies in a celebration of rebirth and resurrection, while others support the idea that "it was a symbolic expression of political domination and economic appropriation" (Ingham 1984: 379). By

being able to sacrifice slaves and captured enemies, the leader would be able to assert their control and power over the land and its people (Ingham 1984). Whatever the reason, there was an underlying belief that the use and display of human trophy items held significance and power.

An area of the Andes that has presented with large amounts of evidence of human trophy taking is the Wari Empire (500 CE- 800 CE). In a study performed by Tung and Knudson, the authors analyzed 31 trophy heads from a site at Conchopata Peru. The study found that of the 31 adults, 42% showed evidence of cranial trauma, indicating that the heads came from victims of violence. Strontium isotope analysis was then performed on 5 of the heads recovered. Strontium is an earth metal that is found naturally in the environment and the levels that are found vary depending on location. Individuals consume strontium in plants and it therefore deposits in bone and dentition. If varying levels of strontium isotopes are found in individuals from the same site, this suggests that the individuals tested came from different regions. The study found that 3 out of 5 of the heads had varying levels of strontium isotopes in the bone, indicating that the individual came from an area outside of the Wari Empire. Coupled with the physical evidence is also iconographic evidence from this region that depicts enemy prisoners and warriors wearing these trophy heads, suggesting that these trophies most likely came from prisoners of war or enemies that were killed during raids or warfare, a feature commonly seen throughout Mesoamerica. Those captured enemies that came back alive were sacrificed and had their heads removed too (Tung and Knudson 2008).

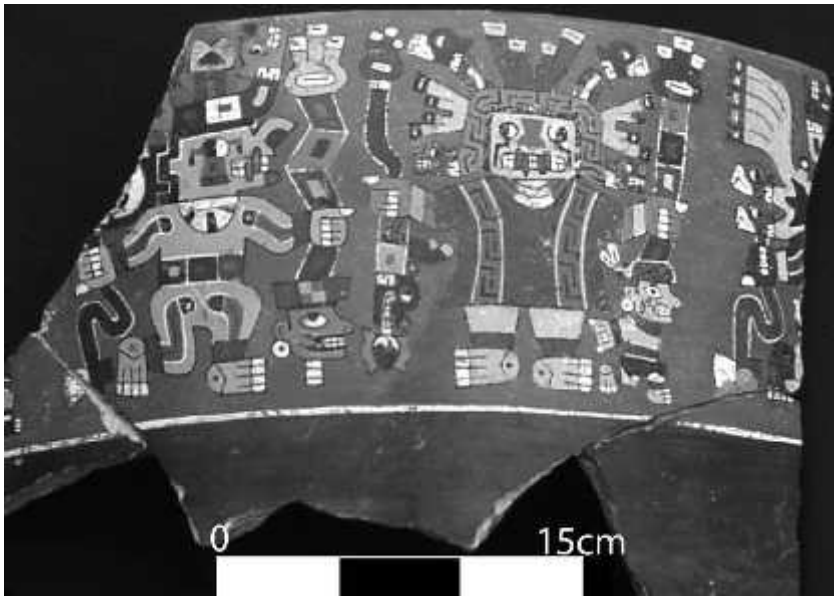

Figure 10. Fragment from a ceramic urn from Conchopata, Peru showing the Front Faced Staff deity with a prisoner whose hands are bound behind his back. To his right is the Winged Profile Sacrificer holding a human trophy head (Tung and Knudson 2008).

Figure 10 reflects the importance of trophy heads. The image displays the Winged Profile Sacrificer deity holding a human trophy head. The image demonstrates the role of human sacrifice and its importance in warfare in demonstrating the superiority of the individual taking the trophy (Tung and Knudson 2008).

Tung and Knudson also report on evidence from this area of child sacrifice which was relatively common in this region. Strontium isotope analysis confirms that these children were taken from other areas outside of the Wari Empire, but were brought there for sacrifice. Following sacrifice, the bodies of the children were dismembered and the parts were used as trophies, especially the head. The use of trophies heads from children as well as adults helped to bolster the power and influence of the state as well as assert

the control that they had over the region. By using the strontium isotope analysis, Tung and Knudson are able to demonstrate the role that intragroup violence played in motivating the taking of trophies (Tung 2007; Tung and Knudson 2010).

The Nazca (200 BCE- 600CE) are another society in the Andean region that presents with evidence for trophy taking, this time in iconographic representations. One of the common themes that appear in their ceramic art is that of war and trophy taking of human heads (see Figures 11 and 12). Art objects from the region often bear images of successful warriors bearing the heads and trophies from defeated enemies. Figures 11 and 12 are examples of effigy heads meant to symbolize a human trophy item. The effigy head in Figure 11 presents with typical signs of human trophy heads in this region in the form of the eyes and mouth being stitched shut. The practice of taking trophy items was "not only to prove a warrior's personal victory, but also to obtain for himself and his community a magic talisman in which the power of the defeated enemy was thought to reside" (Townsend 1985:130). Among the Nazca, trophy items were used to demonstrate an individual's skill and militaristic abilities, but they also served a religious function as a protective talisman (Townsend 1985).

Figure 11. Trophy head effigy of the Nazca people (Townsend 1985).

Figure 12. Mantel showing warriors with trophy heads, Nazca (Townsend 1985).

Archaeological evidence is also present for trophy taking among the Inca of the Andes (1400-1532 CE). The archaeological record indicates that Inca leaders would sometimes take an enemy leaders body, dismember it, and then use the body part, "transforming skin into drums and bones into flutes" (Tung and Knudson 2008: 915). In this region, the practice of taking human trophy items was most significant to the elite ruling class (Ogburn 2007; Tung and Knudson 2008). Other human trophy items from the Inca include jewelry made from teeth, cups made from skulls as well as trophy heads. The trophy cups that were made from the skulls of enemies or their leaders as well as the drums had to undergo special processing in order to be utilized. To prepare cups, the brain was removed and the inside cranial vault was smoothed out. Gold leaf was then applied to the surface, creating the appearance of an extravagant and expensive drinking vessel to be used among the elite class. The drums were an entirely different process. In order to create the drums, the victims had to be flayed, often while still alive. After the skins were removed, they were stuffed with straw or ash until they regained the original shape of the victim. The drum was then prepared in the stomach cavity of the individual while the hands, if they were not removed from the body, were used to beat to drum. These drums could then either be played in battle or at festivals and ceremonies. These two types of trophies were unique to Inca culture and were used to commemorate victories (Ogburn 2007).

In this region, once again, we see that trophy items stand as a sign of militaristic strength. Following a victory, the armies would send the heads of the enemy warriors who were slain back to the king as physical proof of their success. These trophies would

then be used in state celebrations as a way to intimidate any enemies to the elite class while also serving as a reminder to the people of the power and prosperity of the emperor. They could also convey a persons' status and wealth as well military might and control, a similar motif seen among many other groups throughout the Americas (Ogburn 2007).

Throughout the different regions and groups of North America (400 BCE- up until the nineteenth century), violence and warfare are evident in the archaeological record. The osteological evidence for conflict among the differing groups appears in the form of

> …embedded projectiles or scars from spears, arrows, darts, or bullets; depressed skull fractures, nasal fractures, tooth fractures, broken ribs, and forearm parry fractures from clubbing implements; decapitation, scalping, dismemberment and other signs of trophy taking; more extensive bone breakage, cut marks, punctures, burning and related perimortem damage suggestive of torture, corpse mutilation, and/or cannibalism (Lambert 2002: 210).

Lambert then goes on to state that the presence of multiple victims, trophy items, and defensive structures strongly suggests deadly intentions and aggression between groups and individuals. Other forms of evidence of interpersonal violence and aggression also come from artistic or iconographic representations of war and trophy head taking (Lambert 2002). Overall, there seems to be an association between the taking of human trophies items with a warrior's skill in battle and their military prowess. The trophies,

often in the form of hands, feet, limbs, scalps, or complete heads served as physical proof that they had killed their enemies (Axtel and Stutrevant 1980; Mensforth 2007).

Trophy taking is not exclusive to human bone remains such as the La Contingencia rasp . Soft tissue features such as human scalps were also taken as trophies. This is an aspect of interpersonal violence in which the top of the head and hair are removed with a knife. In North America, this seems to be one of the most popular forms of trophy taking. Often times, the scalps were taken and displayed on poles or lines hung outside the village to signify that group's success in war. These scalps would be specially prepared by "drying, stretching on hoops, painting and decorating" and would often be used in ceremonies to celebrate success in battle. Most groups preferred to take scalps from those that they had defeated because they were much easier to transport than other body parts and could be removed rather quickly, allowing the individual to take the scalp then make a hasty retreat (Axtell and Stutrevant 1980; Lambert 2007).

There are a number of reasons associated with the taking of scalps, not just as display of military success and prowess. In looking at artistic representations of wall art from sites such as Basketmaker II and Freemont (400 BCE- 400 CE) and comparing them to the physical evidence from different sites from around the Americas, there are a number of associations that become apparent. Aside for representing an individual's military prowess, these kinds of trophies were also used for ritualistic purposes because they were perceived as having supernatural powers and fertility and rain making properties. The images often depicted trophies, in the form of scalps, decapitated heads,

or other body parts, in the hands of or in context with a shaman, supporting their role as supernatural objects (Schaafsma 2007). Other possible reasons for the taking of human trophy items may have also included retribution for a past crime or mending ones status after public embarrassment or loss of status. For example, if a man's wife were to leave him for another, that individual would go out, kill an enemy, and bring back a trophy as a way to mend their damaged reputation and regain the respect of his group (Mensforth 2007).

The Native Americans of the Great Plains (ca. 1-1700 CE) probably have the most information and case studies of any Northern American group when it comes to evidence of human trophy taking. This region has provided large amounts of physical evidence of violent conflict from small scale raiding all the way to full out warfare. For the men of the tribes, "prestige and leadership within the tribe could only be attained by successful warriors", and trophy taking among these groups was one way to attain this (Owsley et al. 2007: 125). There are a number of historical and ethnographic accounts that discuss the mutilation of the remains of dead enemies and how they were used. Most commonly taken were the scalps of enemy warriors, but other body parts, like the hands, were also utilized (Ewers 1997; Owsley et al 2007). Osteological studies have been performed on the physical material recovered from this area and these studies have found that "cuts on cranial vaults produced by scalping, cranial pathology characteristic of survival after being scalped, dismembered and decapitated remains, trophy skulls, and intentionally modified human bones, such as long bones made into musical instruments

and cranial vaults fashioned into bowls" all demonstrated the presence of human trophy taking among Native Americans of the Great Plains (Owsley et al. 2007: 125).

Once these items were taken and processed, they could be used in a number of ways. Artistic representations from Cheyenne ledger art show individuals of a tribe involved in a scalp dance in which trophy scalps and hands are being used in celebrating the tribe's victory at the Battle of Little Big Horn (Owsley et al. 2007). Another case in which trophies were taken, this time for revenge, occurred among the Crow Indians. Five members of the Blackfoot tribe had stolen horses from the Crow. The thieves were caught and killed, after which their bodies were brought back to the Crow camp and dismembered; "the heads, hands, feet, and privates were cut off, paraded on poles, and thrown around the camp" in order to demonstrate that revenge had been attained for the theft of the horses (Denig 1930: 491-492). It is important to note that in cases such as this, there is evidence of intragroup violence which stimulates the act of trophy taking not only among Native American groups in North America, but in groups residing in Mesoamerica and South America as previously discussed.

Figure 13. Chippewa necklace made from human fingers (National Archives and Records Administration 1871-1907).

A type of trophy item specific to the Plains Indians is finger necklaces. There are a number of museums, such as the Buffalo Bill Historical Center, the Denver Art Museum, the Smithsonian Institution's National Museum of Natural History, and the National Museum of the American Indian that all have necklaces that contain human finger bones in their collection. The reason that these objects were popular are that they are small, relatively easy to make, and can be quickly processed so that decomposition of the tissues does not begin. These necklaces, such as the one seen in Figure 13 picture

above, are made by removing fingers from the victim which are processed into pendants that either appears in the form of fleshed finger tips or as defleshed phalanges that are then strung together on a necklace. Osteological investigation shows that on some of the necklaces, the size and shape of the phalanges are consistent in coming from a single victim. However, other necklaces contain pieces from multiple victims; one necklace from the National Museum of Natural History contained close to thirty finger tips (with skin and nail still attached). These objects symbolize an individual's success in war and their ability to defeat enemy warriors (Owsley et al. 2007).

Warfare and trophy taking was very popular among the northeastern tribes of the Iroquois (ca. 1300CE). One thing each of the group had in common was the ways in which warfare was ritualized through prisoner sacrifice. Like many other Native American groups, trophies were taken from battle and brought home as a sign of military prowess and a victor's success in battle or as a status symbol. Specific to the Iroquois tribes was this prisoner sacrifice. After losing a family member in a violent conflict/war with another group, warriors would bring back living enemy prisoners to their village as a living trophy. These prisoners would then either be integrated into the family to replace the loved one that was lost, or would be ritually sacrificed in an elaborate ceremony (Trigger 1976; Williamson 2007). Following the ritualized death of these captive enemies, their bones would be reused or put on display, or fashioned into other objects. Archaeological research into this area has uncovered a number of items, such as skull rattles, beads and pendants made from the remains of enemies, each serving as an indication of militaristic success (Williamson 2007).

The Hopewell of North America (ca. 1-400 CE) are different from the other groups in North America discussed thus far in the use of human trophy items in that their items were used primarily for ritual and shamanistic purposes. This is the first time in North America that we see human bone becoming a craft medium in the form of flutes, whistles, sucking tubes, rattles, etc.. Studies have shown that these objects were used in connection with shamanistic transformation into animals, ancestor worship, and ceremonies to the dead. Art forms from this group depict animals feeding on human heads, indicative of success in warfare. The items discussed above, however were used in ceremonies, usually by shamans. These items would often be carved with figures and symbols relating to cosmology (Seeman 2007).

One example of such an object is a whistle that was carved from a human right radius (see Figure 14). Osteological evidence suggests that the radius belonged to a female between the ages of 40 and 45. “The bone shows marked signs of careful preparation such as cutting, scraping, polishing, and drilled perforations”, indicating that it was made with some skill and precision (Baby 1961: 108). On the posterior surface of the bone is a geometric pattern, but it is unknown whether or not this design held any significance. The instrument was also probably worn on the body, evidenced by two small holes drilled into the sides of the whistle that would have been used to string the instrument onto the body, and utilized during elaborate burial ceremonies (Baby 1961).

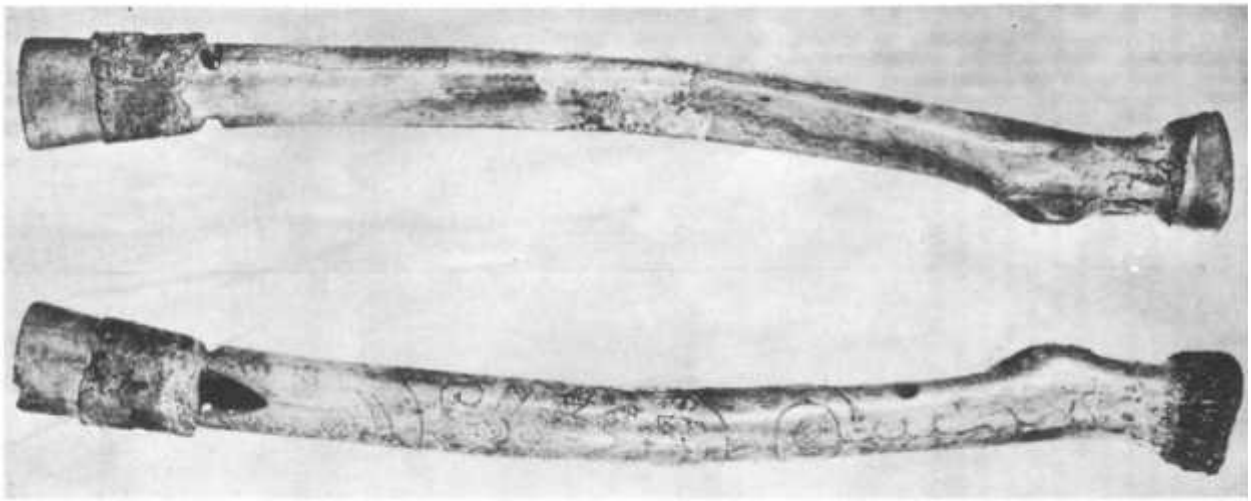

Figure 14. Hopewell engraved bone whistle made from right human radius (Baby 1961).

The use of musical instruments played an important role among Native American groups, especially in Texas. Archaeological investigations have produced wind instruments, such as whistles, and a number of percussion instruments such as rattles and rasps. Though the rasps that have been recovered were not made from human bone like the object of the study, they still had symbolic significance. Ethnohistoric accounts from this region document festivals and ceremonies in which marathon singing and dancing would be performed. Percussive instruments were especially important in these cases as they provided the rhythm that was danced to. Percussive instruments were important for creating a trancelike, meditative state during the ceremonies and were therefore used during important supernatural or spiritual events. Though the instruments here were not created from human trophy items, examples such as this reflect the ceremonial and ritualistic importance of musical instrument in the Americas (Turpin 2010).

Another large area that presents with evidence of the taking human trophy items in North America is among tribal groups in California (4000 BCE- 1850 CE). Like other regions of North America in pre-conquest times, California presents with physical archaeological evidence of violence and conflict throughout the area. Many burials from a study performed by Jurmain et al. had evidence suggesting human trophy taking because a number of the skeletons with evidence of trauma were lacking heads, hands, and limbs (2009). In this region scalps were, once again, a popular trophy item. These items were brought back to the village after a victory, put on poles and danced around ceremonially in a celebration of the enemies defeat. In this region, like many others, full heads or just scalps were taken off an enemy warrior on the battlefield and brought home as a sign of that individual's military prowess. Linguistic analysis by Lambert suggests that the practice of taking trophy items, specifically heads and scalps in this region, was not something that originated in this area, but was brought in by those immigrating from other tribes and regions across North America (Kroeber 1976; Lambert 2007). This is an important fact because it demonstrates how beliefs and customs can be disseminated throughout an area. The taking of human scalps was widespread and prevalent all over North America; there is ample evidence in support of this. The case with California demonstrates how the act of trophy taking was appealing to the different groups living in North America because it supported a certain ideology and goal of the Native Populations.

Another study from California looked at a cemetery that contained evidence of human trophy taking. Osteological investigation proved that the individuals were adult

males. Further investigation showed that twelve of the individuals had distal humeri with evidence of trauma in the form of cut marks that were consistent with butchering while others were missing the forearm altogether. Further proof of human trophy taking came when a number of worn and polished forearm bones were found separately from the individual burials that were missing those bones. The taking of these items supports the idea that they were taken at a time where warfare was common and these items would have served the purpose of bolstering ones image and as a sign of high status, power and prestige. It also demonstrates the degree of intragroup violence occurring in the area. The amount of trauma supports that groups living in this region were in conflict with each other and the act of trophy taking would have served as a way of demonstrating ones power in warfare and conflict (Andrushko et al. 2005).

It is important to take into consideration that the Native American populations were not the only groups to participate in human trophy taking. There are many sources that confirm that European populations that settled in North America participated in trophy taking, for different reasons though. Early European settlers would encourage and pay friendly Native American groups to take scalps from other groups that were hostile towards the European settlers. Later on, as more conflicts started to arise between the European settlers and the Native populations, the English promoted the taking of scalps of Native Americans, offering them compensation for every enemy scalp that they brought. This case demonstrates the effectiveness of the reasoning behind trophy taking. The English settlers used the ideology of the Native American against them. In taking the heads and scalps from Native Americans, the English settlers were effectively

demonstrating their strength and military prowess in a way that would effectively intimidate Native American populations (Axtell and Sturtevant 1980).

The northwest coast has been inhabited for over 10,000 years and trophy taking has been a part of the culture there up until the mid-nineteenth century. The native inhabitants of this region were a part of maritime societies in some parts of Washington up into Alaska. The region was home to a number of diverse groups that had their own views and ideology. The historical and archaeological records of this region reflect the belief that cannibalism, torture, sacrifice, and violence in general were common in the Northwest Coastal area. These beliefs were perpetuated by early mariners to the region who would often report tales of headhunting and cannibalism to dissuade competitors from doing business with natives as well as discourage crew members from deserting to live with the native populations. Similarly Native Peoples were eager to dissuade the mariners from trading with competing native groups by describing these competitors as cannibals. Through interactions with the native groups, visitors found that human trophy items, usually appearing in the form of heads and hands, were popular objects often used in trade. The act of trading human trophies was believed to be indicative of warfare and cannibalism because the items were thought come from enemy warriors and were taken as a sign of victory (Lovisek 2007).

Other studies performed on this region indicate that intragroup violence and warfare were much a part of life for the past five thousand years. At a site in Prince Rupert Harbor that dates to about 1850 BCE- 250/500 CE, many of the skeletons that

have been excavated have been recovered with additional skull pieces, long bones and weapons. One author believed that the skeletal material that had been recovered from the graves was used in rituals and maybe even shamanism. According to Cybulski's study, both men and women were victims to decapitation and some of the long bones presented with modification to be used as tools (1978). He states that this kind of ritual taking and modification of bones may have had something to do with the popular belief in this region that the head held a persons' soul. This coupled with the belief in this region that the dead had incredible power supports the view that these skulls had ritual significance. These objects held power that had the potential to affect people's lives. To further support this idea of a ritualistic or spiritual power to human trophy items, this region presents with cases in which preserved hands and some trophy heads were used in times of sickness as well as during ceremonial feasts (Cybulski 1978; Lovisek 2007).

Common throughout the Northwest Coast was the belief that a person's soul resided in the head. The tongue was also another important part of the head because it was responsible for communicating with supernatural powers through the act of whistling and singing. To ensure that a slain enemy's soul did not return to the body and harm the person that killed them following death, the Kwakiutl of this region, who practiced trophy taking up until the 1850's, believed that decapitation and dismemberment of the body was the only way to ensure that this did not happen. The act of decapitation would release the soul and after a Kwakiutl warrior had decapitated their enemy, "he would become possessed by the dead man's spirit and began to dance and acquire the victim's

names, crests, and supernatural powers. By killing enemies and taking heads the warrior, in essence, acquired supernatural power" (Lovisek 2007: 55).

Other groups from this area also use the taking and displaying of trophy heads as not only for their supernatural powers that they could grant the owner, but also as symbols of status and military prowess. Several of the groups are known for the chiefs sleeping on beds made of human skulls. These skulls were those of previous chiefs and great warriors and stood as status symbols and the power of the chief (Lovisek 2007).

Some believe that the items recovered from the Prince Rupert site had more to do with the warfare in this region. Ames states that the weapons found in the Prince Rupert Harbor burials serve as an indication of their warrior class and the skulls serve the purpose of reinforcing the individuals' strength and military prowess (1994). Along with the physical evidence, in the form of heavy skeletal trauma to many of the skeletons that have been excavated from this time period, the northwest coast presents with a rich oral tradition of war stories. This demonstrates the importance of warfare in this region and the high regard that warriors were held in. As a result, those individuals buried with skulls wanted to show that they were great and powerful warriors in life (Ames 1994).

As previously stated, the trade of trophy heads and hands was not uncommon to the region. There are a number of first person accounts of Europeans encountering Native Peoples that wanted to trade items such as heads and hands with them. Often the European mariners would react in shock or horror to the offer, but the Native populations would respond that these items are from their enemies and that the mariners had nothing

to fear, as long as they did not anger the people of the Northwest Coast. As more Europeans became interested in items such as trophy heads and hands, interest in taking of human trophies was stimulated which subsequently led to an increase in raids that were performed on enemy villages. It is possible that "human trophy taking became less random and more dedicated towards specific enemies of equal or greater status from whose death and dismemberment, property, and privileges could be appropriated" (Lovisek 2007: 51-52). As one can see, the presences of Europeans in this region greatly impacted the native ways of life. As demand for material items increased, the Native Peoples began to make raids directed at certain individuals who could potentially contribute to their income as opposed to the taking of human trophy items in warfare (Lovisek 2007).

Human trophy taking in the Northwest Coast was very popular and held symbolic significance to the Native Peoples. It served as an example of military prowess, a status symbol, and as a way to inherit the supernatural powers of those the trophy heads were taken from. These objects also had ceremonial significance based on their artistic representation on objects used during rituals and ceremonies. Unfortunately, there is not a lot of historical data on why hands were taken, just that they were objects of value that were used in trade and barter with European mariners. Though trophy taking was popular throughout this area for a long time, long before European contact, the act of trophy taking did not last. In the early 1800's, European settlers began to inhabit the area and prohibited the act of taking trophies because of the violence (Cybulski 1978; Ames 1994; Lovisek 2007).

Results

3-1: Measurements

In looking at the tables on the measurement attained from the different sections (Tables 1 and 2), there was no set measurement or pattern for depth of the incisions and width of the sections between each incision. The width between each incision has measurements falling between 4.81mm and 11.45mm, but no two measurements were the same. Measurements taken of the depth of each incision fell between 0.36mm and 2.81mm with the exception of incision 21 which appeared abnormally deep, at 4.65 mm, when compared to the measurements of depth obtained from other incisions. Each of the measurements taken from the notches was different which demonstrates that there was no clear pattern to increasing/decreasing depth and width, but rather that depth and width are random. The differences in depth and width measurements demonstrate similarity and consistency with other *omechicahauxtli* recovered from West Mexico and can be used in the experimental replica in order to determine the difficulty involved in creating such an object and the level of personal motivation required to carve a rasp.

In the recreation of the instrument, an attempt was made to create the incisions following the distance and random patterning of the La Contingencia rasp. The measurements of the La Contingencia *omechicahauxtli* are displayed in Tables 1 and 2 below.

Table 1: Depth of Incisions in Millimeters from Proximal Most to Distal Most End

Fragment Number:	Incision Number:	Depth of Incision:
1	1	0.49
1	2	0.83
1	3	1.21
1	4	1.33
1	5	1.23
1	6	1.36
1	7	n/a*
2	3	n/a*
2	4	1.92
2	5	1.49
2	6	1.76
2	7	2.72
3	B	n/a*
3	C	0.87
3	1	0.85
3	2	1.25
3	3	2.81
4	A	0.52
4	B	n/a*
5	8	n/a*
5	9	0.50
5	10	0.54
5	11	0.36
6	12	2.15
6	13	2.27
6	14	1.73
6	15	0.77
6	16	n/a*
7	16	1.51
7	17	1.36
7	18	1.78
7	19	1.61
7	20	1.57
7	21	4.65

* Incisions too fragmented for accurate measurement

Table 2: Width of Sections Between Incisions in Millimeters from Proximal Most to Distal Most End

Fragment Number:	Incision Number:	Width Between Incisions:
1	Distal end/I1	26.23
1	I1/I2	9.30
1	I2/I3	9.53
1	I3/I4	8.75
1	I4/I5	7.33
1	I5/I6	9.04
1	I6/I7	7.68
2	I3/I4	9.66
2	I4/I5	6.77
2	I5/I6	10.13
2	I6/I7	6.67
3	IB/IC	8.62
3	IC/I1	8.27
3	I1/I2	9.07
3	I2/I3	9.51
4	IA/IB	10.71
5	I8/I9	10.96
5	I9/I10	11.45
5	I10/I11	8.72
6	I12/I13	5.84
6	I13/I14	8.49
6	I14/I15	8.30
6	I15/I16	4.93
7	I16/I17	4.81
7	I17/I18	7.92
7	I18/I19	7.38
7	I19/I20	7.74
7	I20/I21	5.41
7	I21/Proximal end	26.54

3-2: Microscopy: Dino-Lite Microscope

By using the Dino-Lite Digital Microscope, one is able to see wear to the surface of the *Omechicahauxtli*. Figures 15 and 16 demonstrate the changes, such as rounding to the sections in between the incisions and wear to the bone surface expected from extensive playing and the cut marks of the incisions. Unplayed, one would expect them to look more like the surface of the other musical rasps featured in Figure 2 that do not possess the same levels of wear to the bone surface that is present on the La Contingencia rasp.

There are a number of circumstances that can lead to a bone exhibiting surface polish and wear. These include when a bone lies in sand for an extended amount of time and the sand is constantly redistributed; from weathering; from lying in water for an extended amount of time while other object pass over it (Klein 1984). The object was buried and not lying in a river, but it does present with the characteristic changes that occur from having another object pass over its surface repeatedly in order to be played. This playing would have led to the rounding of the edges, the polishing, and the overall changes that are visible on the instrument.

Based on comparative evidence it is possible that the wear to the surface of the La Contingencia rasp is due to being played as a rasp. To test this, the wear was examined with a scanning electron microscope and an experimental replica was created, played and then examined allowing a test to determine the wear caused to the surface of a bone rasp from playing.

Figure 15. Dino-Lite Digital Microscope Image of Fragment 1, Incision 4 demonstrating the rounding that occurred to the sections between each incision as a result of the extensive playing, (Image by J Rhodes).

Figure 16. Dino-Lite Digital Microscope Image of Fragment 2, Incision 6 demonstrating the cut marks created from the stone tools and the wear changes that occurred to the surface of the bone, (Image by J Rhodes).

3-3: Microscopy: Scanning Electron Microscope

Examination through SEM imagery provides further support that the instrument had indeed received extensive wear and polish to the surface due to another object rubbing back and forth across the surface for an extended period of time. The wear on the bone surface in figure 17 is very different from a normal bone surface. This can be seen in comparing the image in Figure 17 of the artifact with Figure 18 of a natural bone surface of a sheep long bone. The texture of the La Contingencia rasp appears different from natural bone due to the surface of the bone being worn down by a playing implement, creating a polished appearance. Unplayed, human long bones would appear more uneven and rigid like the surface of Figure 18. Though magnification is different, there is an obvious difference in the surface texture.

Under the SEM, one was able to see that there was polishing to the surface of the femur, and that this unusual appearance to the bone surface is not typical among unused bones. This supports the initial observation that the *omechicahauxtli* was heavily worn.

This wear, as previously noted, could have been caused by another object repeatedly passing over the surface of the instrument. This hypothesis is tested through experimental study.

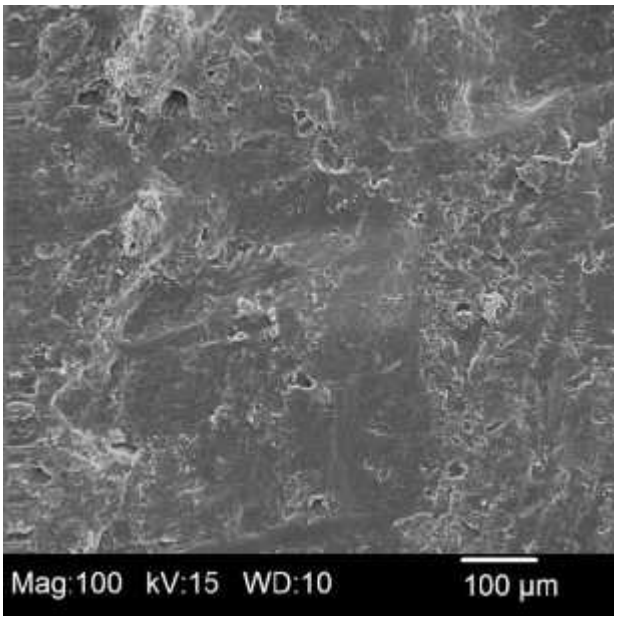

Figure 17. SEM Image of Fragment 5. Images shows wear polishing to bone surface of the section between incisions 9 and 10 (Image by C Leriche).

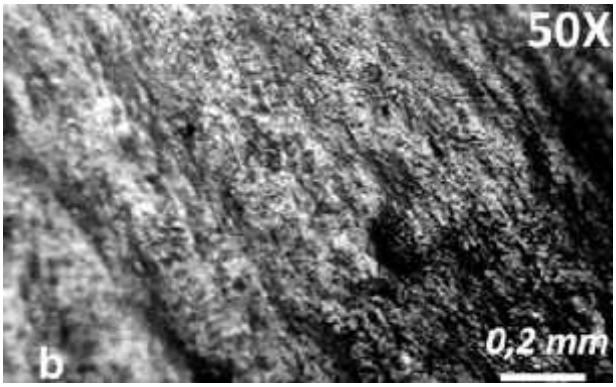

Figure 18: Natural bone surface of a long bone from a sheep under SEM (Buc 2011).

3-4: Experimental Studies

By looking at the surface of the bone under the Dino-Lite Microscope and SEM, it was already evident that there was wear patina to the surface of the bone. To determine further if the changes seen on the La Contingencia are attributed to extensive playing, a replica of the instrument was created and played in an attempt to replicate the changes seen on the surface of the bone.

Experimental carving and playing was performed on pig femurs in order to determine the amount of effort, intent, and time it takes to create an *omechicahauxtli* (see Figure 19). Processing the pig femurs was the biggest time commitment, and the processing of human femur would have required the most time of the original carvers. Though the pig femurs had already been butchered, they still needed to have the remainder of the flesh, tendons and cartilage. Excluding the time it took for the bones to boil because they would not have been boiled in the original context, it took about 3 hours to fully remove any material remaining on the bone. Removing the distal ends of the bones and cleaning out the marrow cavity also added to the overall time required to process the bones. In the original context, this would have taken even longer because the femur would have had to be removed from the defeated enemy after which all the flesh and remaining material would have to be removed (Pereira 2005). After the long bone was cleaned, little effort was required to finish creating the instrument. A total of 11 incisions were made on the pig femur with period accurate obsidian stone tools that had been flintknapped, a process that took about 2 hours. These stone tools pictured in Figure 20 were sharp flakes that did not have any further processing done, such as serration, so as to match the obsidian stone tools that were recovered in the same context as the La Contingencia *omechicahauxtli* (see Figure 21). One problem that occurred while carving the bone was false starts. It was difficult to begin the incisions and the obsidian stone tool often slipped, creating a false start on the bone surface. However, once an incision reached a certain depth, it was easier to keep the stone tool in the notch (see Figure 22).

One concern that came up while recreating the instrument was the level of dryness of the bone. Had the bone been too fresh, the surface may have been difficult to carve due to the collagen in the bone. Had it been too dry, however, it may have flaked off instead of carving. When the notches were carved into the bone surface, it appeared to be at the optimal level of dryness and was relatively easy to carve.

Figure 19. Replica *omechicahauxtli* recreated from a pig femur (Image by C Leriche).

Figure 20. Replica obsidian stone tools recreated using flintknapping, (Image by C Leriche).

Figure 21. Obsidian tools found at the archaeological site of La Contingencia in Jalisco (Image by J Rhodes).

Figure 22. Dino-Lite Digital Microscope image of experimentally carved and played pig femur showing wear from playing(Image by C Leriche).

Figure 23. Dino-Lite Microscope image of changes to the bone surface (Image by C Leriche).

The final experiment was playing the instrument and trying to recreate the wear patterns seen on the La Contingencia *omechicahauxtli*. The rasp was played with both bone and shell implements and found that the shell tended to create a louder, more appealing percussive sound. The bone was played for about four hours in order to see how much change from wear occurred to the bone during that time period. Figures 22 and 23 demonstrate that there was some wear to the surface as well as rounding to the sections in between each incision. This study demonstrated that an individual does have to contribute significant effort to create the object and that the level of playing evident on the instrument recovered archaeologically was higher than the rasp that was recreated. This study indicates, therefore, that the *omechicahauxtli* was extensively worn likely from being played as a musical rasp, a unique characteristic in comparison to other musical rasps recovered from this region.

3-5: Cross Cultural Comparison

The results of the cross cultural comparison reveal that there tended to be underlying similarities in the taking of human trophy items among the groups living in the Americas. The most common driving force behind taking these items was a as a display of military power of the group as a whole or of an individual. Trophies would serve as a visual signs of prestige and could either be displayed around the area of habitation of the group or on the body of an individual. By taking and displaying human trophy items, an individual warrior would bolster their status and identity as a successful warrior, a king would display his superior power and militaristic abilities, or a group

would display their success in war and the defeat of their enemies. Power displays played an important role in the taking of human trophy items. In each of the regions studied, human trophies items had the power to intimidate rivals and serve as a visual display of strength. Instances in which trophies are taken for this reason tend to present with evidence of high levels of intragroup violence. Among groups such as the Aztecs and the Native Americans of the Great Plains, there is evidence of conflict between groups which acted as a stimulus to trophy taking. The act of trophy taking would have served as a representation of a group's superior power and control.

Another common motivation for taking of human trophy items was ritualistic. Among many groups, trophies were used in ritualized ceremonies for their magical/mystical properties. Some groups in the American Northeast believed that the body parts taken as trophies held supernatural powers. For the Maya, the birth of an heir or death of a ruler would require large scale sacrifice in order to reenact the mythical events of their origin story. In their elaborate ceremonies, victims would be sacrificed, representing rebirth or resurrection. This is a common feature to many of the groups living in the region of Mesoamerica (Berryman 2007). For many the theme of resurrection and rebirth was an important aspect of their creation myth, hence their use in funeral rituals. In myths surrounding Quetzalcoatl and the *Popul Vuh*, rebirth plays an important role human trophy items are meant to symbolize this mythic resurrection/rebirth, thus stimulating the need for sacrificial victims and trophies.

The final possible motivation for human trophy taking, specifically of the femur bone, was ancestor veneration and legitimacy of the ruling class. Many burials throughout Mesoamerica present with evidence of being disturbed then resealed and with extra or missing femora. This evidence indicates that femora of revered ancestors were utilized as a means indicating to the citizens of ones right to rule and their support from ancestors.

Analyzing the use of the femur bone among Mesoamerican groups, it is evident that the femur played an important symbolic role. It was in this bone that an individual's power was stored and it was believed that display, utilization, or consumption of flesh from this bone was a way to inherit the power of the person it belonged to. Also specific to musical instruments, such as the object of this study, was the role that they played in ceremonies. Native American populations are known for their rituals and ceremonies. Along with ethnohistoric accounts of these ceremonies is archaeological evidence of musical instruments in a variety of forms. These instruments were meant to accompany singing and dancing and were utilized because of the rhythmic sound that would emanate, causing a meditative state. This was essential in spiritual and mystical ceremonies that took place throughout the Americas.

Discussion

The La Contingencia rasp presents with high levels of wear patina that can be observed on the surface of the instrument. Other notched musical instruments recovered from this region do have some wear patina, presumably from being played, but nowhere near the level of wear seen on the La Contingencia rasp. The studies performed on the instrument demonstrated that there was no patterning to the measurements taken from the instrument, but that the incisions were random. This may indicate that there was no ritual importance to the depth of each incision or the distance between each. It may also have been the result of the difficulties involved in carving the instrument. As previously discussed, during the experimental recreation of the instrument, it was challenging to begin carving an incision, making a pattern or standard measurement very difficult. The original carver may have experienced the same difficulties, and therefore may not have been able to create a pattern. The microscopic studies performed on the instrument as well as a comparison with other musical rasp recovered from the region of West Mexico indicates that it was indeed heavily worn, presumably from continued playing of the instrument as a musical rasp.

Using the studies that examined notched human long bones from Mexico and a cross cultural comparison, one can come close to interpreting the meaning of the La Contingencia rasp and what purpose it may have served in its original context. It is likely that this instrument was taken because of its symbolic significance as a storehouse of an individual's power and used for ritualistic purposes and played for mortuary events,

symbolizing rebirth and resurrection. Support for this comes from evidence of the Maya and Aztec. Both cultures used human trophy items to express their ideology, although the Aztecs also utilized these items as statement of political power. The use of human trophy items among the Maya, who precede the time period of the creation of the La Contingencia rasp, and the Aztec, who followed that time period, in rituals suggests that the La Contingencia rasp was likely used for the same purpose. It is likely that the ritual use of the objects originated with the Maya and simply continued and further developed into the Aztec time period. Studies performed by McVicker and Pereira also support the use of objects like *omechicahauxtli* in mortuary rituals for their symbolic significance of rebirth and resurrection (McVicker 2005; Pereira 2005). In looking at other reports of archaeologically recovered human trophy femurs, it is evident that this bone specifically held power and significance.

The lack of human remains and the indication of valuable pottery indicates that the rasp may have been ritually buried on its own as an offering with its own pottery, a feature not unusual to other instances in which *omechicahauxtli* have been recovered (McVicker 2005; Pereira, 2005). The lack of human remains also indicates that this object was not likely used as a visual indication of militaristic abilities or as an object of legitimacy by ancestors. Instead, the instrument likely had something to do with the myth of Quetzalcoatl, and would have been broken to assimilate to the events of the story of the deity, or was a continuation of the Mayan tradition of using human trophy items in rituals of rebirth/resurrection. It is likely that the *omechicahauxtli* recovered from this region do not have to do with warfare and conflict, like many of the other societies and

regions that we have looked at, but instead seem to fall along the lines of ritual symbolism. Evidence suggests that musical rasps had more to do with mortuary rituals because of their percussive and rhythmic sound which would create a meditative state whereas many other human trophy items had to do with asserting ones prowess and status.

Conclusion

5-1: Conclusions of Study

After examining the *omechicahauxtli* from the cemetery site in West Mexico and performing experimental archaeology to determine the amount of effort required for creating such an object, it was found that the instrument in question was heavily utilized in its entirety, unlike many other rasps recovered from this geographical area. It is very likely that the object was interred on its own in a symbolic burial. This indicates that it may have been a highly regarded ritual object with great significance in the community or to its owner. Support comes from previous studies performed on notched long bones from the region of West Mexico in which *omechicahauxtli* were ritual sacrificed by breaking and then buried on their own.

Through the performance of a cross cultural comparison of human trophy items, it was demonstrated that there are underlying commonalities to the act of human trophy taking. There are similarities in the types of items that were taken, the significance of those objects, what they symbolized, and the ways in which those objects were used. The beliefs surrounding these objects were not locally specific, but occurred in every region of the Americas.

Studies such as this one are necessary because they reveal an aspect a much larger and complex social environment of the different regions of the Americas. These studies combine archaeology, osteology, and cross cultural comparison of items and

iconographic works from the Americas in order to better understand the act of trophy taking, the symbolism and significance behind it. Though there are a lot of differences in the uses and functions of these objects depending on region, there are a number of underlying similarities. These similarities in the function and symbolism of the object demonstrate how ideas passed between different groups and regions, revealing the influence that they had on one another. They also reveal intergroup conflict and violence and how this tended to exacerbate trophy taking among conflicting groups. Studies such as this one can aid in reporting evidence seen in the archaeological record and interpret what the physical and iconographic remains which can help inform and expand the information available about these socially complex societies.

5-2: Recommendations for Future Research

Though it was demonstrated that the La Contingencia *omechicahauxtli* was heavily used, there are other studies that could be performed that can inform on the use of this object, as well as other *omechicahauxtli* that have been recovered. A promising study could be performed on the musical rasps in the collection of Federico Solórzano Barreto to categorize the differing levels of wear present on the bones. It was noted that wear to the surface of the bones featured from this collection do not present with the characteristic bone changes along the entirety of the playing surface in the same way that the La Contingencia rasp does. A study could be performed that would document the levels of wear to each of the long bones that would contribute to this study of the La

Contingencia rasp by providing local examples with varying levels of wear patterning to compare it to.

Other studies could be performed to see what way the rasp was held, though the position the *omechicahauxtli* was held in did not appear to affect playing ability nor did it affect sound quality. Another potential study could look at the way bone dryness affects the carving of the instrument. As the experimental bones were drying, the collagen that gives the outer layer of bone its plasticity was drying out. Had the bones become too dry, the quality of the bone may have been affected and they may have ended up flaking, rather than slicing, but that was not the case. A study could be performed to see at what level of bone dryness carving is most effective.

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