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ESJOA is very proud to present our 16th volume. The articles being featured are written by current CSUDH students and one recent alumnus. Publishing as an undergraduate is a great privilege, and we hope to inspire future undergraduates to publish their research.

Stereotypes and Forensic Anthropology

Sheyla Flores



"My name is Sheyla Flores, and I am a current senior at CSUDH. I decided to write on this subject because it is a controversial topic that should be resolved. As anthropologists, we are aware that the idea of race is nonexistent, but we should be able to spread our research throughout all fields so that they too can realize that race is socially constructed and not biological."

To understand why Forensic Anthropology and Biological Anthropology uses certain skeleton traits to determine race, we need to investigate why these traits exist, and how and why the idea of “race” emerged. Forensic Anthropology is so unique and fascinating in that anthropologists in this field understand that there are a variety of different presentations possible for skeletons that have been found, but they also understand why the patterns of certain skeletons exist. These anthropologists are also trained to know that identifying an individual by their ancestry is not always correct. While it helps to confirm a positive identification, they understand that there are many factors that affect not just the human body, but the bones. Geographical factors, cultural modifications, diseases, famine, severe injuries, and bone stress are just a few examples of bone modification causes. In this research paper, the attempt to unravel this idea of stereotypical traits in estimating “race” for a forensic case is challenged. It is emphasized that these traits should not be used any longer due to the strong emphasis on “race” and the idea that it creates of an individual when determining ancestry.

These patterns or traits are considered stereotypical because they are the only current patterns that have been found within the United States. Adequate research of skulls from all over the world could disprove the ideologies that exist in the U.S. For starters, biological anthropologists refer to the pattern of these traits as a cline. They have enough information to map out some of these traits and can explain why they exist, such as adaptation of the environment or genetic drift. A quick example is the narrow nasal apertures that are commonly found in “European” skulls versus in comparison to the shallow nasal bones of an “African American” skull. The difference here exists because these individuals have descendants from different areas of the world. Concave nasal bones will allow for easier breathing in warm climate areas, whereas narrow apertures are a benefit in cold climates—they warm the cold air that passes through the nostrils. Nonetheless, error has been continuously reported because the stereotypical traits we are accustomed to and work off of can be biased in nature. Results of a file can point out that the size of the nasal bones will determine the skull as “Hispanic” when they appear intermediate, but this individual could be from anywhere in the world. He or she could be from a different culture, and forensic cases have the tendency to pin a certain image in the public’s head due to racialized categories commonly used in the United States. The closest definition that can

be applied to the word “race” is “a category of humankind that shares certain distinctive physical traits.”

A great example of misanalysis of the skull is explained in Nancy S. Ossenberg’s article, “Within and Between Race Distances in Population Studies based on Discrete Traits of the Human Skull.” This article analyzes three specimens of Native American descent. Her main goal is to disprove that the industry cannot use limited data to provide a thorough analysis. She mentions the studies of Corruccini and how his data misanalysed the three individuals under question. Corruccini’s research was based on 72 individuals of American White and Negro populations. Corruccini’s analysis claimed that the Native American individuals’ measurements in skulls correlated with that of a “Amerind-Negro,” which was incorrect. Ossenberg states:

[...] perhaps the most significant implication of these spurious Amerind-Negro distances is in underscoring the following requirements of ideal research design for a population study: choose samples comparable in regional scope and diversity, include a large number of skulls so that conclusions can be based on a consensus rather than on the evidence of one sample per group and use all available classes of attributes.

Ossenberg emphasizes the importance of conducting research without assumptions. Most of the studies that have been conducted, many of which are referenced in physical

anthropology texts, originated from ideas of race. Ossenberg's three Native American individuals were Eskimo and of northern region descent. It is common to find skulls with concave nasal bones and a prominent brow ridge in this region as well, due to the climate in which they lived. Their structure allowed them to survive in the severely cold weather and solidifies the point that traits in skeletal remains cannot be believed to be consistent when there is a limited use of information and analysis to work off of.

The most influential ideas in science stem from some of the most respected men that have existed in society. That is not to take away from the fact that they had neutral intentions in understanding brilliant ideas, but other ideas and topics of research were not the greatest. One great example is Immanuel Kant, a famous and well-respected philosopher of his time. He was one of the first to imply the idea of race and how it was a distinction among people due to the geographical areas that they belonged to. Unfortunately, he was so well-known and respected that this idea of "race" stuck and persisted for years to come. Kant's idea was extremely supported among racist groups. They believed that there was a science behind the way people acted and thought that biology could explain it. Nina Jablonski's article, "Race," touches on the brief history of Kant's racial idea and explains how, in the 20th century, this idea was challenged. The most influential scientists of the 1960's (during the civil rights movement) discredited "race" and

confirmed that "races themselves could not be scientifically defined." (Jablonski 2015, 80). Although it is true that race cannot be physically seen in skeletal remains, from then out the idea of race was used as a class system. People began reporting that certain races were better or prioritized due to their grouping. Kant had sparked the brains of the public, and the fire has not gone out since. This idea of "race" is very much still in place today. It has been so intertwined in our culture that we do not think anything bad about it because it has become a norm to society. Forensic Anthropology in the United States has unforgivably adopted this ideology and has been using this as a system to classify individual bones to help estimate determining who the individual is in cases within the forensic field.

"The Skull Collectors: Race, Science, and America's Unburied Dead," by Ann Fabian, explains how the groupings in Forensic Anthropology came to be. Samuel George Morton is considered the founder of the underlying racist ideas of cranial features. He studied about a thousand individuals of the United States population and came up with the Caucasian, Mongolian, American, Malay, and Ethiopian groups based off crania. He was supposedly able to classify and quantify the differences in the remains of these individuals. Morton's research was racist in nature. His intention to study whether there were any differences in skeletal remains was only to prove that a certain race was better than another. Morton's main frame of research

was measuring the cranial capacity of these skulls. Morton thought that the bigger the skull, the smarter the individual. Fabian's investigation proves how the idea of race was woven into the basis of estimation in anthropology, which was later heavily adopted in the forensics industry.

To further the issue, Johann Casper Lavator was known for his work regarding physiognomy. Lavator argued that, "If you could properly read someone's body shape, ... then you can understand their personality..." (Switek 2019, 178). In his book, *Skeleton Keys*, Brian Switek explains how Lavator's idea was based on the studies of what the 18th century scientists were obsessing about. Lavator thought that because someone looked a certain way, they were supposed to act a specific way as well. Cops use these kinds of methods and believe that criminals could be identified by their appearance, for instance. This is an unfair idea to form a foundation for research. Early scientists wanted to connect physical appearance with culture, which was not only racist, it was also ignorant and degrading to all cultures and the science of biology and all individual sectors within it. They wanted to justify this ideology with science, and that is an idea that must be disregarded when it comes to ethics in forensic anthropology. A more adequate and ethical way to determine variety in skeletons is understanding that variety exists and that it cannot be confined within one grouping.

Another thing to consider is that cultural groups from around the world modify their

bodies for cultural pride and belonging all the time. Cultures like that of the Kayan women of Northern Thailand elongate their necks and, as a result, modify their skeletons. Their cultural modification goes deep to the bone, and, if it was found in the U.S., it would be classified incorrectly because the data that is here only goes far enough to describe five groups. In reality, there are probably hundreds of different biocultures that exist. Needless to say, one cannot determine that an individual looks a certain way because they act a certain way or practice in certain cultural beliefs. Even the elongation of the neck can be misconstrued to be "Mongolian" in ancestral descent. African cultures such as the Ndebele tribe of South Africa also practice elongating necks in women, which can result in incorrect skeletal identification. The point is that the data used here is insufficient and cannot be limited to the ideas of race. Scientists in the field of anthropology should not support these groupings and should suggest other methods for groups, such as groupings that are based off geographical clines and not cultural factors. So many cultures use their bodies to express themselves, and some go as deep as being seen in the bones. However, many people of different cultures modify their bodies in a similar way, such as the elongation of the necks. If forensic anthropologists were to find such remains in the United States, they would have an increased chance of miscalculating estimations if they limited themselves to the groupings that were created by past researchers.

Pathology on bones have been studied and have also fallen victim to the studies that were based on race. For example, rickets found in a child's bones will often classify those bones as belonging to an "African American" individual because of studies that have been conducted on the remains found on slave plantations. In her article, "Nutritional Health of Enslaved Africans from Newton Plantation, Barbados: New Data," Kristina Shuler explains how the findings of past researchers "show that higher rates have been observed skeletally in enslaved populations from plantations such as Remley (27% male and 36% female), with much less frequency reported among free North American groups such as Cedar Grove (20% male and 5% female) and the Dallas Freedmen Cemetery (4% male and 3% female)" (Shuler 2005, 177). Although her research was conducted in the plantations of the islands of Barbados, it shows that research like this is used to trace the ancestry of an individual's remains. They assume the remains are African American because it was common for plantation workers to suffer from diseases, such as rickets, due to poor nutrition. However, realistically, rickets exists in all cultures as it is the result of malnutrition. People living in societies where resources are scarce or insufficient are no stranger to rickets because they do not have enough of those resources to adequately sustain their children. One of the main reasons why rickets is linked to someone of African American descent is because, as mentioned earlier, many skeletons found on plantations

were diagnosed with rickets. Slaves were not treated humanely and were not given enough to eat. They worked for their lives and not for a living, so they survived off scraps and whatever was available to them, which was usually not much at all.

Nowadays, rickets is found in children of all gradient skin colors. We see it in poor societies, where healthy foods are almost impossible to get or where the resources necessary to raise a child are scarce. Finding symptoms of rickets can be the downfall in identifying an individual as it can lead to a racial identification. This is an example of why socioeconomic diseases cannot be used to classify ancestry, since diseases like rickets are not something that are found in just the children of African American descent. It is frustrating to comprehend that this kind of classification is still accepted, but anthropologists are better able to understand that finding rickets does not tell us what the individual looked like. Instead, it gives us an idea of the lifestyle the person might have lived and is a step closer to estimating who the individual was.

The issue here is that separating cultures by color has existed since early civilizations. Egyptians used to differentiate people of different areas of the world by color. For example, red symbolized them, black their southern neighbors, yellow signified Asians from the East, and white was the people from the north. The separation of the self from the "other" has been apparent in human civilizations as early as the 14th century.

Although ideologies like this have been so deeply rooted, the reevaluation of biological anthropology has been proposed and has been slowly transitioning within the field. “A Century of Skeletal Biology and Paleopathology: Contrasts, Contradictions, and Conflicts,” by George J. Armelagos and Dennis P. Van Gerven, presents the steps that biological anthropology has taken to step away from the findings of researchers in the past. The authors explain how Bioarchaeology “spawned” from the works of physical anthropology and skeletal biology. They claim that Bioarchaeology promised “three factors: (1) a population perspective; (2) a recognition of culture as an environmental force effecting and interacting with biological adaptation; and (3) a method for testing alternative hypothesis that involves the interaction between the biological and cultural dimensions of adaptation” (Armelagos and Van Gerven 2003, 58). These factors are clear indications that the field wants to disregard the original research that was provided to the industry with ideas concerned with race. Thorough and adequate research could disprove the FORDISC program that is used in physical anthropology alone. FORDISC is a data base used in the United States’ Forensic Anthropology field where measurements of skeletal remains are inputted to identify the individual under question. It would confirm that the skeletal groupings that exist within the program are not what is needed to aid in the justice of human remains. Although previous studies have given us insight on what is

possible to look at while determining ancestry in an individual, it most certainly should not give an opinion of what the he/she might have lived like. Armelagos and Van Gerven’s argument is that the researchers before us were “more concerned with explaining behavior than understanding biology” (Armelagos and Van Gerven 2003, 54).

The real goal in any given research and/or forensic cases is to come up with meaningful research questions that explain the human condition. These research questions are “solvable through the analysis of human skeletal remains” (Armelagos and Van Gerven 2003, 53). Biological Anthropology is attempting to step away from earlier unreliable resources and are developing with new researches that can help the industry evolve by accepting the fact that race is a social construct. As such, it is not efficient to try to estimate the identification of skeletal remains under question within a forensic case. Anthropologists within the forensic industry can help navigate the new research and enlighten scientists of the future by presenting their findings at conferences or making their publications public for all to access. Slowly, race can be proven to be non-existent in the biological aspect of humans. Skin color does not define the way that people act and using such information in identifying a victim under question is racist, even when it is not intentional.

As was previously mentioned, anthropologists can assist in breaking away from racist research at all levels of the

corresponding subfields. For example, in the linguistic anthropology subfield, research shows that linguistic discrimination exists in everyday situations, even when it is not done on purpose. In forensics, linguistic discrimination can be seen in the verbiage that is used in the case. Terminology such as “Mongolian,” “African American,” or “White” is used and assists in building a bias profile for the victim. Even the way a report is written can show the way that investigators feel about the individual, even though they do not know them. Pinning “race” to the individual creates an opinion on how they could have lived or what kind of culture they might have been a part of. Breaking away and understanding that race is insignificant when it comes to determining ancestry is a step closer to practicing the “new physical anthropology.” The new anthropology believes that adequate and careful analyzing of human remains can help answer questions of research, such as forensic investigations. The new research can provide resources where terminology is carefully chosen to limit the use of groupings like “Hispanics,” which eventually can lead to the new trend of using ancestral descent as a means of helping estimate who the individual was rather than what the individual was doing. In the new biological anthropology, race does not exist and focuses instead on geographical factors that exist in the human body for the survival of the human race.

The idea of race should not exist in biological anthropology and needs to cease from existing in this field.

The definition of race is a category of humankind that shares certain distinctive traits. This should remind us that differences in skeletal remains are to be seen as a cline or estimate and not as a determination.

Unfortunately, the forensic industry in the United States works on a limited number of skeletons. We have only researched among a small number of the world population.

In the U.S., most of our traits correlate based on the people that have migrated here. Therefore, we see groups such as “African American,” “White,” and “Hispanic.” Forensics use these limited groups works because our population is made up of a select few, and it is also easier for the police to limit their groupings to something much “simpler.” Even then, however, the correlation that is used in textbook context does not go hand in hand with real skeletal traits. My research argues that, in practice, the idea of “race” does not exist in biological anthropology. This idea can be disproven through examining and understanding why certain traits exist in different areas in the world. Luckily for the forensic industry, anthropologists that participate in this field can help disassemble the idea of race in estimating ancestry of an individual. They see these patterns in individual remains as a correlation rather than a positive identification. Anthropologists in the field of forensics know that there is more diversity in culture than there is in the human skeleton.

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Palo Mayombe, Forensic Anthropology and Cultural Anthropology

Matthew Fusco



"Matthew Fusco recently graduated from CSUDH with a degree in Anthropology. His interests lie in the field of cultural anthropology, specifically the anthropology of religion. He is currently applying to PhD programs and hopes to conduct ethnographic research studying African inspired religions of Latin America and the Caribbean."

Forensic anthropologists are often called to investigate human remains discovered in strange circumstances. One of the more peculiar ways that human remains come to the attention of forensic anthropologists is in the context of religious rituals. The Afro-Cuban religion known as Palo provides a notable example of how human remains might be incorporated into religious rites. Palo, sometimes referred to as Palo Mayombe or Palo Monte, is a religion cultivated by the descendants of Kongolese slaves, which uses human bones as centerpieces in their rituals.

Because its practitioners are sometimes associated with grave robbing and organized crime, Palo and forensic anthropologists often come into contact with one another. Forensic anthropologists are usually called to examine the contents of prendas, which are cauldrons or sacks containing,

among other things, human bones. Prendas are the centerpieces of Palo rituals and are believed to house the soul of the person whose remains are interred within them.

Although the role of a forensic anthropologist is to examine human remains, as students of culture, they are in a unique position to mediate between police, the media, and society at large when discussing this often misunderstood religion. Furthermore, when working with religious paraphernalia, especially in the context of a crime, forensic anthropologists should take it upon themselves to ensure that these sacred items are given as much respect as possible to build trust between Paleros, law enforcement, and the community.

This essay will attempt to show how and why forensic anthropologists should act as cultural mediators between Palo and society at large. The thesis of this essay will be structured and supported by delving into the history and practices of Palo, how examining Palo paraphernalia is conducted by forensic anthropologists, Palo's association with criminal activity, and the relationship Palo and forensic anthropologists have with one another.

The Palo Religion

Palo Mayombe and Palo Monte began in Cuba during the nineteenth and twentieth century. The religion was developed among the descendants of Central African and Kongolese slaves inhabiting the island. Palo also developed around the same time as

Santeria, a religion cultivated among ethnic Yoruba slaves which synchronized Catholic saint worship and their traditional, indigenous belief systems (NewOrleansMistic; Ochoa 2007, Introduction). The word "Palo" translates to "branch" or "wooden stick" and is a reference to a number of sacred sticks which are integral parts of their sacred prendas (2007, Insinuation and Artiface; Pokines 2015, e2). Because they developed in close proximity to one another, Palo has been erroneously called the "dark side" of Santeria. In actuality, they are totally separate religions with minor similarities between their rituals and spiritual hierarchies (Sanchez 200, 10; Winburn 2017, 2-3).

To be initiated into Palo, the neophyte undergoes the rayamiento, a ritual involving the ritual scarification of the fledgling Palero (male) or Palera (female) with razor blades or cock spurs. These scars take the form of symbols meant to give the initiate, or *ngueyo*, the ability to access the powers of Palo (Cabrera 2016, 22; Ochoa 2007, Virtudes). The head of a "House of Palo" is called a *yayi* or *tata*, a female or male priest who own the original prenda of the house.

Prendas are iron cauldrons or sacks containing the essence of the dead within. This essence is called the *nfumbe* and resides within a collection of human bones, most importantly the skull (2007, Nfumbe). Every prenda is dedicated to a different *mpungu*, or spirit, who controls the different powers of nature. Depending on the *mpungu* they are dedicated to, the prenda will require different

bones and ingredients to access their power. The owner of the prenda will also be in possession of a human tibia called the kisengue. This item acts as a scepter that can be used to conjure the dead from within the prenda and direct it to whatever action it has been summoned for (Cabrera 2016, 318-19). The nfumbe acts as the animating force which embodies and directs the power of the mpungu it has been chosen to inhabit (Ochoa 2010, Prendas-Ngangas-Enquisos).

In Palo, the traditional method of acquiring the bones of a prenda is through grave robbing. These bones are ideally pilfered from cemeteries for two reasons. The first reason is that skulls containing brain matter are highly prized because the bones can still “think.” The second reason is because the Palero can perform divination rituals at a chosen grave to determine if the nfumbe within would be suitable for becoming a prenda. The soul of the dead must be willing to work with the Palero before being interred within the prenda. If necessary, the nfumbe can be bargained with and coerced into becoming part of the prenda, though this is not ideal. Divination in Palo comes in several forms; a notable example is the ritual ignition of gunpowder to determine the will of a nfumbe. Another method of divination is casting ritually prepared coconut husks, which, based on their placement, help determine the will of the dead (Canrera 2016, 21, 275, 304; Ochoa 2007, Nfumbe, Decay).

The powers of Palo come from the supernatural abilities of the dead residing

within the prendas and their power to reorder fate for their owners. Within the prenda are a number of other ingredients, which further adds to its power. Animal bones, grave dirt, precious stones, money, mercury, railroad spikes, horseshoes, and feathers are just some of these ingredients. In short, the prenda is meant to represent a microcosm which contains all the powers of nature, ready to be accessed by the nfumbe and its owner (2007, Lucero Mundo; Cabrera 2016, 276). Prenda’s take two different forms in Palo: prendas cristianos and prendas judias. Prendas cristianos, which is translated to Christian prendas, only use the remains of baptized corpses and can only perform beneficent acts of magic. Alternately prendas judias, or Jewish prendas, exclusively use unbaptized bones, particularly those of murders, the insane, or criminals. Prendas judias are only used for acts of maleficence, or evil magic (2007, Judias; 2016, 364-66). Prendas and the nfumbe within must be satiated with offerings, such as smoke or blood from sacrificed animals. Palo is considered a “hot” or aggressive religion, and prendas must be fed to keep them loyal to their owners. If a prenda is neglected by its owner, it can turn on the Palero by making them sick, disrupting their lives, or killing them outright (2007, Judias, Decay).

Forensic Examination of Palo Religious Paraphernalia

Because Palo uses human bones and animal sacrifice in their rituals, police are often called

to investigate the possibility of homicide or related crimes (Gill et al 2009, 1458). Forensic anthropologists will then be called in to investigate the contents of prenda's once they've been seized by the police. As mentioned previously, prendas contain a variety of ingredients, which give the cauldron "life." The examination of Palo cauldrons can be a time-consuming task, as the anthropologist must categorize a wide variety of materials within the prendas. Human skulls and phalanges are commonly found in prendas along with non-human remains, such as dog bones or insects. It is important to note that many prendas contain quicksilver within them. Mercury, sometimes called azogue, is considered to have a variety of miraculous powers. It can drive off evil spirits, bring luck or love, and is used in a variety of magical rituals in Latin America and the Caribbean (2009, 1461). Quicksilver is used in Palo because of its association with vitality and is said to act within the prenda like a beating heart (Cabrera 2016, 304). Given the toxic nature of mercury, examinations of prendas should be done wearing appropriate protective gear (Gill et al 2009, 1461).

The disassembling and examination of prendas is a process that deserves close attention and care from the forensic anthropologist. Examining a prenda has been likened to an archeological excavation. Each ritual item and layer of sediment that fills the prenda has been accumulated over long stretches of time. Because of this, every piece of material culture within the prenda should be

photographed, noted, sketched, and laid out according to each stratigraphic layer within. Doing this can help determine the history of the prenda by revealing the owner's magical operations, animal sacrifice, and whether the prenda is prenda cristianos or prenda judias. If the prenda contains any personal items or clues that can help identify the bones within, this can aid law-enforcement or the anthropologist in determining the identity or origin of the remains (Winburn 2017, 19).

When examining human remains within prendas, it is important to try and determine the origin of the bones within these cauldrons. Most Palo practitioners are law-abiding citizens and can obtain skeletal remains through legal channels. Legally obtained bones are often acquired through online sources. While bones sourced from cemeteries are considered more powerful in Palo, some prendas have been discovered with bones taken from anatomical specimens. A prominent example of how human bones could be obtained online used to be the website Ebay. In the past, Ebay allowed vendors to sell human bones on their website if the intended use was for scientific research or study. Ebay has since amended their policy to outlaw selling any human remains other than hair. Allysha Winburn, a forensic anthropologist who has studied Palo, suggests that in the absence of legally sourced nfumbe, Paleros may need to gather these bones through alternative means (Winburn 2017, 13).

With this in mind, forensic anthropologists

must determine whether bones found in prendas were obtained from a legitimate source or from grave robbing. Determining the source of these bones can be accomplished by examining the taphonomic or biocultural traits of the remains. For example, if the bones have evidence of soft tissue clinging to the frame, root damage, soil stains, posterior cortical flaking or warping, then it is likely they were acquired through illegal means. Additional evidence of grave robbing can be revealed by examining post mortem trauma inflicted on the bones. Some evidence of sharp force damage could be an indicator of flensing done to the bones during ritual preparation. Furthermore, if the bones have knife marks along the basilar part of the cranium or along the mandible, this could mean the bones were roughly disarticulated from the rest of the cadaver (Winburn et al 2016, 12).

If the bones being examined were acquired through grave robbing, it sometimes comes to light that they were stolen from outside of the United States. This can be determined by examining the physical characteristic of the bones. Surgical procedures and dental development might indicate whether or not remains are of domestic or foreign origin. Because adherents of Palo come from the Caribbean or Latin America, the possibility of a nfumbe being taken from foreign graves is very likely (Gill et al 2009, 1458; et al 2016, 1-2).

Despite the efforts of forensics experts, the majority of remains found in prendas will go unidentified. Without a name or knowledge of

any living family, the remains confiscated from Paleros will usually remain indefinitely stored as evidence. Alternatively, after examining the prendas, if it has been determined that the bones were legally sourced and state law approves, it may be possible to return the prenda to its original owner (Winburn 2017, 19-21; 2016, 30, 33).

Palo and Its Association with Criminality

Because of the taboo nature of their beliefs, Palero go to great lengths to keep their meeting places secret (Ochoa 2007, A Feast Gone Awry). The reason for this is that their use of human bones and animal sacrifice will catch the unwanted attention of law enforcement. Another reason is that, as previously mentioned, the association Palo has with grave robbing is not just the result of stereotyping or bad press. Palo devotees whose prendas have been confiscated by the authorities are sometimes investigated for, and charged with, grave robbing offenses. Several examples of this behavior has been documented by domestic and foreign news agencies. For example, in Massachusetts, a man was charged with breaking into two family tombs to steal human bones for Palo rituals (Associated Press 2018). According to a survey of Palo houses in Florida, forty-seven percent of the bones used in prendas were obtained through grave robbing (Winburn 2017, 13). In Venezuela, there has been a rash of graverobbing incidents tied to Palo Mayombe. Because of the importance human remains have in this religion, various bones

can fetch hefty prices on the black market (Valencia 2018; Romero 2009).

In addition to their association with grave robbing, Palo has also been tied to organized crime, particularly narcotics trafficking. Religions like Palo offer criminal adherents supernatural protection from law enforcement, ways to strike out against their enemies, and protection from rival gangs or cartels (Kail 2015, 54-7). A particularly notorious example is Adolfo Constanzo, a serial killer and drug lord who engaged in animal and human sacrifice as expressions of a deviant form of Palo Mayombe (Grieg 2012, 89). Other drug traffickers have been associated with Palo Mayombe. For example, one of the Los Zetas crime syndicate founding members had been rumored to “put his enemies names into a pot” as a hex against his opponents (Kail 2015, 120). Additionally, a raid by the U.S. Fish and Wildlife Service discovered a Palo practitioner in possession of dozens of smuggled and sacrificed animals, which were being used for religious and magical purposes (Pacenti 1998). It should be stressed that, despite the negative reputation of Palo, the presence of Paleros and prendas does not immediately indicate the presence of crime, and each case should be assessed without prejudice and on its own terms.

Forensics Anthropology’s Relationship with Palo

To the outsider, the practices of Palo might seem disturbing, deviant, or even evil. This stigma can mean that Paleros are vulnerable to being persecuted or misunderstood by law

enforcement and the media. Because of the unique training that anthropologists receive, we are in a position to act as intermediaries between these disparate groups.

For example, many law enforcement officials still consider Palo and Santeria to be the same religion despite differences between their faiths. Minor similarities between these two religions can further confuse unknowing laymen. For example, Santeria sometimes makes use of iron pots when venerating the orisha, a god or goddess, Ogun. Some santeros and santeras, Santeria priests and priestesses, might also be trained as Paleros, further adding to the confusion (Gill et al 2009, 3). Untrained individuals may see superficial similarities like these and assume Palo and Santeria are a single religion. This confusion has led some members of law-enforcement and the media to refer to the bones used in Palo as “Santeria Skulls,” though no such thing exists (Winburn et al 2016, 4; Gill et al 2009, 1462). There have also been cases where Palo has been erroneously labeled as “Voodoo.” One forensics expert reported that some of his colleagues still referred to Palo as “Cuban Voodoo” (Winburn 2017, 14).

Through the examination of ritual remains, forensic anthropologists are able to give law enforcement officials a definite answer about whether or not ritual items come from Palo or Santeria (Winburn 2017, 12-13). Santeria and Palo both share similar practices of animal sacrifice, spirit possession, and a similar hierarchy and function of spirits. These differences can be determined by examining

relevant religious paraphernalia, the names of spirits, and other ritual practices. The biggest determinate in distinguishing Palo from Santeria is the presence of a human skull. While Palo exclusively makes use of human skulls as their ritual centerpieces, Santeria does not. Santeros and Paleros also treat their religious materials differently. Santeros will put their materials on display for anyone to see. Alternatively, Paleros will keep their prendas safely out of sight in a shed or unused bedroom (Winburn et al 2016, 4-5). Helping law enforcement differentiate between these faiths will not only help the police in their investigations, but also provide contextual information to help destigmatize both religions.

Because of the sensitive religious nature of these bones, keeping and caring for the contents of prendas provides another complication for the medicolegal community. To avoid offending Paleros who have had their prendas confiscated, it may be pertinent to learn how to properly respect, care for, and dispose of the prendas. In some cases, hiring a Palero to consult with medicolegal professionals can be an important asset when investigating Palo related crimes. Hiring a Palero in this capacity can also build trust between these groups and create further dialogue between them (Winburn 2017, 21).

As mentioned above, Paleros will often acquire their bones from legal sources. Palo's association with black magic and criminality has been the subject of much bad press, particularly when compared to the Judeo-

Christian values common in the United States (Winburn et al 2016, 30-1). It is the duty of the forensic anthropologist to attempt to understand the worldview of Paleros and communicate it effectively to the authorities, media, or other concerned parties. Forensic anthropologists can advise law enforcement on how to handle Paleros and to remind them that the presence of human remains does not immediately signify the presence of murder or any other crime (Winburn 2017, 22-23). Building a rapport between these groups can encourage mutual respect and develop a positive relationship between them.

Conclusion

In conclusion, the forensic anthropology community has an opportunity to foster greater cultural understanding between members of the Palo community and society at large. As information becomes more ubiquitous and groups of people who, in the past, would have never interacted come together, we can no longer afford to remain ignorant of each other's beliefs and cultures. This is especially true in the context of law enforcement. Palo's religious practices, which appear exotic and violent compared to mainstream American religions, can make them the victims of prejudice. A trained anthropologist who can help mediate between law enforcement and the Palo community is in a position to improve the relations with the practitioners of Palo and other Afro-Caribbean religions.

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Natural Mummification

Fernanda Hernandez



"My name is Fernanda Hernandez, and I am a current senior at CSUDH. My interests in both Biology and Archaeology have led me to look further into the processes of mummification. Biology and Archaeology are two fields that I have great respect and admiration for."

Mummies have always been a subject of fascination for scholars and ordinary folk. We have adapted the idea of mummies into imaginative and historical platforms like television, books, animation, etc. When we think about mummies, the first thing that comes to mind is Ancient Egypt. The ancient Egyptians manipulated the mummification process by using techniques in which nature alone was not enough to preserve and prepare corpses. This would be considered type III artificial mummification, or in simple terms, it means culturally intentional. Other cultures have unintentionally used nature to create these dried-up dead people. So how did they do it? What is the process of mummification under natural circumstances? The answers to these questions are derived from extensive research by various scholars throughout time. I will list the cultural conditions and climates that make

mummification possible, the stages of decomposition that allow the mummification process to evolve, and several cases, such as Otzi the Iceman and the migrant victims on the southern U.S-Mexican border, that showcase the different ways mummies occur either intentionally or unintentionally.

Natural mummification is the process by which the skin and organs of a deceased person or animal are preserved without any chemicals used by humans (Daughtry 2019). The conditions in which natural mummification occur are usually hot and dry or extremely cold temperatures, where a lack of oxygen is present. The decomposition speed significantly slows down depending on the surrounding environment. When a person dies, the decomposition process begins immediately. Stage one, Pallor mortis, involves paleness within the first 30 minutes after death, along with a lack of pulse and breathing. Stage two, Algor mortis, is the change (decrease) in body temperature to ambient temperature (usually when we begin to note that the body getting significantly colder). Stage three, Rigor mortis, is the stiffening of the joints and muscles, which usually occurs 2 to 6 hours after death. This is something that is easily recognized when initiating first contact with the corpse, due to chemical changes. The next stage is Livor mortis, which is when discoloration of the skin begins to become apparent due to the pooling of blood in focused areas of the body because the heart is no longer able to circulate the blood. The amazing part about this stage is

that, by examining the concentration of blood around certain body parts, the position that an individual died in and whether the body had been moved after death can be determined.

Putrefaction is the decay or rotting of the body by breaking down proteins. Mummification is one of the different levels of decomposition based on environment. In hot and dry climates slow the process of discoloration and insect activity for about a week. About four months in, we begin to see early decomposition, such as discoloration, bloating, and deflation. If the body is left in this oxygen-deprived environment for a couple years, the flesh will dry and the appearance of wrinkles will be present. Many times, the clothing and items the deceased was carrying at the time of death will likely be preserved along with the body. Just as hot temperatures contribute to the preservation of corpses, cold climates have also supplied us with a number of incredibly preserved ancient bodies.

Mummified bodies have been found in deserts and frozen glaciers. For example, Otzi the Iceman, a 5300-year-old mummy, was found in a glacier in the Italian alps. This case fascinated archaeologists and scientists everywhere because his body was almost entirely preserved. Otzi's bodily fluids were completely drained when found. The South Tyrol Museum of Archaeology's (2016) examinations indicate that he was approximately 45 years old, 1.60 m tall, and weighed 50 kg. Given that the body had a significantly small amount of fat, he must have had a sporty figure. Epidermis analysis

proved that he had dark, medium-length hair, and during decomposition, his fingernails and toenails fell off. Scientists also discovered the oldest evidence of Lyme Disease transmitted by ticks. These ticks were found on Otzi's body, along with whipworm eggs in his intestinal tract. His teeth were apparently worn out, with a gap on his upper incisors, and there were no signs of any wisdom teeth being present. More evidence from bones and joints determined that he had broken many bones throughout his lifetime, including his hips, ribs, shoulders, knees, and spine. His lungs were blackened due to the constant proximity and inhalation of fire. By examining Otzi's stomach content, we learned his diet included a variety of plants, grains and game. A 2001 X-Ray determined the final results for the cause of death (2016). Otzi was hit by an arrow on his left shoulder, penetrating his subclavian artery, which then led scientists to believe he bled out within a couple of minutes. What does this tell us about the results we can achieve when analyzing naturally mummified bodies? Since the body is so well preserved, we can learn much more about this time period and lifestyle, as opposed to the small clues we gather from a fully skeletonized individual. Otzi is only one of many mummified findings in extreme cold weather environments.

Hot and cold temperatures share a similar decomposition process in which, ultimately, the body becomes mummified. Good examples of hot and dry conditions are the migrant victims that die in the Sonoran and

Arizonan Deserts journeying in search for a better life on the other side of the Mexican border. According to World Socialist Web Site (2001), immigrants that traveled through the "Devil's Path" in the Arizona desert looked like they had "been in the desert for a month-shriveled up ... Have you ever seen a mummy from ancient Egypt? Well, that gives you an idea." This is the heartbreaking reality for many migrants, since exposure to heat exhaustion, hypothermia, and dehydration increase their chances of death. The New York Times published an article on the 500 bodies that have been found on the Texan border since 2014. Timothy P. Gocha, a forensic anthropologist at the Texas State University in San Marcos, is currently working on a collection of unidentified migrants, whose remains were found and left in body bags to decompose naturally (Fernandez 2017). Many of the individuals found have been completely skeletonized, mummified and evidence of wild animals scattering remains. Although well preserved, they are not all identifiable and given numbers instead. Other examples are the 119 mummies from Guanajuato, Mexico, which were discovered in 1896. The mix of the region's climate and soil's chemical components allowed for the incredible preservation of these bodies that displayed shiny teeth, fingernails, hair, genitals, and the terrifying faces of anguish (World History 2015). One of the most interesting of these mummies are those of a woman who died during childbirth and her baby, who is now considered the smallest mummy in the world,

since it is a 24-week-old fetus “which is no bigger than a loaf of bread” (Atlas Obscura 2019). “One body they pulled out, belonging to an Ignacia Aguilar, was found biting into her own arm; it is thought that she was buried alive when the symptoms of her cholera made her heart appear to stop” (Paoletti 2018). During this time in Guanajuato, cemeteries were running out of space, so the government began adding a “burial tax” to keep their loved ones buried. If the tax was not paid, the corpse would be exhumed and kept in a crypt, where it would begin to mummify due to the hot climate.

Peruvian and Egyptian cultures honored the dead by mummification. These two cultures manipulated natural decay to make sure their deceased remained intact forever. In Peru, mummification goes back to around 7,000 years ago. According to the American Museum of Natural History, the Chicharron people practiced mummification thousands of years before the Egyptians. They decorated the mummies with wigs, painted them black and red, and used unbaked clay to create masks for them. Although Peruvian and Egyptian cultures are thousands of years and miles apart, they share certain similarities when it comes to funerary practices. They both buried the mummies with important vessels like cups and bottles, as if the dead needed a drink (like beer) on their journey to the afterlife. The Inca used chicha (corn beer) to stop bacterial activity and the decomposition process. Similarly, the Egyptians used palm wine for the same purpose. The removal of the organs

was thought to be necessary in the afterlife, the organs were put in canopic jars that represented the four sons of Horus and buried them with the dead. There are several differences in techniques between these two cultures. For example, some Incan mummies were victims of sacrifices up in mountainous areas, where they were likely to mummify due to the climate conditions. They used what is called the “Black Technique”. It involves the dismemberment of the body and stripping the skin and flesh, then stuffed with vegetable matter and animal hair (Williams 2018). Incan mummies are known for the positions they were left desiccated in. The final steps were to place the mummy in a fetal position and wrap it in bundles with different textiles. The mummies were often decorated with wigs and masks. Egyptians liked using salt to dry the body and wrapping it in linen before placing them inside a sarcophagus. They also liked to decorate the dead, but they decorated the coffin they were to spend eternity in, instead of the body. The coffin was painted to resemble the person inside and included hieroglyphic depictions of who the person was and his or her importance. A group of undergraduates from the State University of New York created an independent project to compare methods used by the Inca and Egyptians in the mummification process. The students used rats to experiment on while comparing the techniques from both cultures and natural mummification process. The interesting part was the conclusion, in which they compared the weight lost from

desiccation in all three techniques and found that they all had almost identical results. The American Museum of Natural History had an intriguing exhibit called “Mummies,” in which they mentioned the Egyptian mummification of animals. Apparently, these mummified animals were not pets, were bred in large quantities and sold for religious offerings. A lot of the Egyptian gods were animals; for example, Bastet was a cat, Anubis a canine, and the sun god Ra had the head of a falcon. For this reason, the mummified animals were buried in honor of the gods they represented (AMNH 2018).

In conclusion, mummification is an incredibly interesting subject to research and explore. We know that in certain climates and environment, the human body can decompose in different ways or not at all. Thanks to archaeology, we are also able to understand how ancient societies viewed death in comparison to how we view it today. Their methods of honoring the dead has many differences and similarities, even though the geographical locations and time periods are far apart. The mummified remains of animals teach us about the diets and life they lived in their time brings up the question of just how far science is willing to go to bring them back to life. If anyone ever finds a mummified dinosaur, I have no doubt that Jurassic Park will become a “based on a true story” type of movie. We will continue to search for answers regarding the human body and the ways it reacts to different circumstances.

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Handling Ethics in Forensic Anthropology

Jessica Martinez



"My name is Jessica Martinez, and I am an attending Senior at California State University, Dominguez Hills. I chose to publish a paper based on the different ways that deceased bodies are handled around the world. The paper is focused on the way deceased bodies are cared for based on their personal traditions, cultures, and religious aspects and the role a Forensic Anthropologists plays in handling the bodies."

Forensic Anthropology is the study of identifying human remains in a crime scene, during war, natural disasters, or accidental death. This topic may sound interesting to a person who is interested in working with dead bodies or is intrigued with the topic of death. However, there are many medical and legal situations where thoroughly decomposed bodies need identification. Now the question becomes: how can a Forensic Anthropologist genuinely care for and assess deceased human remains while still respecting various religions, traditions, and cultures of the deceased and their community? In this research paper, I will discuss the various forms of ethics and conflicts that Forensic Anthropologists may encounter during their work out of their native country. Also, I will write about different situations faced within different cultural traditions or cultural morals that an Anthropologists must enforce in the field. An anthropologist should have proper reasons for respecting local religious beliefs and traditions, they should also avoid facing ethical issues while handling a body and be prepared to handle the conflicts that may

arise while doing so. This paper will show different ways people handle their dead in relation to their customs and rituals. Anthropologists often talk about ethnocentrism and how everyone should respect others' cultures, traditions, or ideologies. For an anthropologist, it is necessary to know this because they focus their studies on different cultures and should not judge or look down upon different cultures and nations that are not similar or as advanced as their native culture. As a student taking a course in Forensic Anthropology, it is important to evaluate multiple perspectives on the proper ways of handling deceased human remains. In class or on the job, they must learn the different correct ways to handle human remains throughout the world. They would also have instruction on how to handle the dead bodies. Of course, if they are in a class, their teacher would assumedly guide them in the proper tasks of caring for the human bones within the context of their classroom. However, in the instance that a forensic anthropologist is traveling and doing natural disaster or war zone work and trying to identify human remains, forensic anthropologists will not have the same guidance as the student had, nor would the proper protocols be identical because every nation and country has different rules and regulations to follow, based on traditions and protocols.

This essay proposes a bird's eyes perspective on what a Forensic Anthropologist may be faced with on the job while traveling

to help out affected areas during mass destruction. It also teaches the importance of learning different ways of handling deceased human remains, focusing mainly on a traveling Forensic Anthropologist's perspective. It should also open one's eyes to the many ways different countries handle the dead, their different rituals, and cultural beliefs. This essay is broken down into four parts discussing the different challenges and things they may face in the work field.

Traveling and Different Cultures

Many nations and countries often request the help of a Forensic Anthropologist for their vast knowledge and understanding on handling of the deceased individuals. For instance, in Claire Moon's research, she acknowledges the persistence the forensic field has, "Forensic knowledge into the administration of human rights is... a convergence of history, politics, new institutions, social groups and particular individuals" (Moon 2013). They may count on Forensic Anthropologists' knowledge and open-minded views to provide non-egocentric values and respect of other cultures and traditions. This is incorporated with the knowledge of ethics and consideration of traditions that makes a Forensic Anthropologist a great contributor. A Forensic Anthropologist's great knowledge and understanding of the investigation and identifications of human remains in other parts of the world is beneficial to a forensic team.

For instance, working as a Forensic Anthropologist can lead to finding jobs traveling around the world to help other countries with handling massive disasters the correct way.

Traveling around the world as a Forensic Anthropologist means administrating our own or other countries when faced with natural or military/war disasters. When disasters hit, a nation can be destroyed, including massive amounts of land, homes and people. In these devastating instances, lives are lost in horrific and messy ways. During disastrous events, countries call a Forensic Anthropologists to help with identifying and assigning the remains of the people who have died in these instances. It is now up to the Forensic Anthropologist to try and align the bodies to come up with an identification of who they are and where the rest of their remains can be. This may seem like an easy task to some people, but a forensic anthropologist knows the steps to follow.

A Forensic anthropologist should first get acquainted with the countries' culture and their belief system regarding the handling of the dead bodies. In addition, they should investigate what they can or cannot do with the deceased bodies in those countries. How does a Forensic Anthropologist get acquaintance with the belief systems and culture of other countries? They can get to know the people first, get to know the community, their values, religion, traditions, etc. They can even go online, do some research of the community, and try to get

some background information for how they handle their deceased individuals. Another way is by asking the communities how they would like the Forensic Anthropologists to handle their deceased individuals.

While getting invested in the ways of handling bodies, the Forensic Anthropologists and their team should find out if there are certain strategies that the country has for the disposal and recovery of the bodies. If not, they should start to make up a plan and strategize a new solution because this can, "cause tension, but also added to the confusion and stress of relatives searching for family members. The lack of mass fatality plans meant that these issues had to be worked out during the response" (Morgan 2003). The lack of quality and national response that was given to the deceased individuals in Morgan's article caused the decomposing cadavers to be transported to limited refrigerated areas that were far away from the disaster zone. Because of this, families did not know where their deceased relatives were taken.

Having a strategic plan made by the country's government can help alleviate and avoid stress and chaos from the people working this case and their families of the deceased. Also, it would help limit the time the bodies are exposed and being identified. Having this set plan in a nation where these disasters are prominent can expedite giving the bodies a proper burial or after life cultural ceremony and proceeding with their traditional aspects. This would give their families some type of closure.

Cultural Beliefs

As mentioned before, different cultures and nations have different aspects of the afterlife and handling deceased individuals. These cultural beliefs can differ from place to place, but, as the people who are working with and handling these deceased bodies, forensic anthropologists should know to respect and not judge cultural differences because handling of dead bodies may be viewed as horrific and immoral to other cultures.

Cultural beliefs and traditions for handling the dead can change from one culture to another. Some countries have different rules and customs that the living need to follow to honor the dead persons' rights. These rights may be enforced by the nation to be followed by the living (Dunde 2001). Differences in handling the bodies may vary based on a person's national background, like, their religion, lifestyle, culture, and ritualistic aspects of handling the dead. In this section of the paper, I will focus on these aspects of handling the bodies in other countries while traveling around to different countries and their different views of the afterlife.

Traveling can lead to misconceptions and different expectations of handling human remains. Different places have different ways of handling and treating the deceased individuals. One can gather up information on different ways to treat the deceased people by local residents but in the end people's perspectives change, and they may want different practices performed on the deceased. For example, Al-Dawoody states that, "It is

also necessary to engage with community and religious leaders and local authorities in order to convince the public and the relatives of the dead that forensic specialists need sufficient time to examine the bodies. Otherwise, families of the dead risk the pain of being unable to identify their loved ones and unable to visit their graves" (Al-Dawoody 2017). Al-Dawoody also states that Muslims believe in fast burials because of the law of Muhammad. In the case of disastrous instances, it is not likely for a forensic anthropologist to analyze or identify the deceased body in a fast manner. It is more likely for them to take days, if not weeks, to identify the human remains. Talking to the community and their families can help because forensic anthropologists could let them know what to expect and how their cultural beliefs, rituals, and religious aspects are being acknowledged. Providing the best and fastest care for the deceased individuals can aid to lessen the stress. "Families and states may want to have remains returned and repatriated, or at least buried in accordance with their religious traditions...Some traditions maintain that rituals involving the dead body are necessary to ensure peace in the afterlife" (Williams and Crews 2003). Knowing these traditional aspects of the afterlife can help the people working these cases to know why the families might be concerned for the lives and retrieving their family members from the destruction site.

It is important to remember and keep aware that we all have different backgrounds and

traditions and should respect everyone else's cultures. Every country where a Forensic Anthropologist may need to travel to, may have different views or might perform different rituals towards the dead. Other cultures may also have different rules to follow while handling the deceased bodies. Some rules may sound weird or be viewed as taboo in our perspective. But to those individuals, it is something that they have been doing or have been performing for years if not centuries. Some countries or cultures may not allow certain people to handle the dead or different objects to be used towards them. Many countries or religions strictly prohibit the contact between certain individuals and their deceased. In the United States and other places, we share similar customs for handling the deceased bodies. Some Americans and other individuals may share similar aspects of caring for the deceased individuals. For example, "Traditions in Jewish and Muslim faiths require the burial of bodies and body parts... those in the Hindu faith, require cremation" (Williams and Crews 2003). However, we should take into consideration that not every country shares these similar beliefs and would view this as a taboo ritual. Therefore, not judging or labeling one's tradition as wrong is the best thing one can do to not offend anyone.

Culture Conflicts

Being in other countries and having to interact and get familiarized with the other nations' cultural traditions towards handling a

deceased body can lead to misinterpretation. These misinterpretations can come from the forensic team and also from the other countries. The native people might think that the forensic team may give them back their relatives' bodies quickly, but this could be difficult in massive disasters, depending on the governmental structural plan they have in the case of mass destruction involving dead bodies. Cultural conflicts may lead to possible lawsuits because of the "myriad beliefs and practices about the proper methods for the disposal of dead bodies based on different conceptions of "the body" and of the afterlife" (Dundes 2001). These beliefs and conceptions should be taken into consideration when handling and treating a deceased body. It is important to try and not offend or discriminate against the traditional aspects for handling the deceased body. Explaining that these measures cannot be done while working on a natural disaster case will also help with miscommunication and misinterpretation.

Cultural beliefs can lead the people to view the way a forensic anthropologist deals with the bodies as disrespectful for the deceased individual and their family members. If we begin to examine the facts and everything that goes through while handling a deceased body, I too would consider it taboo. In a National Geographic video about the Indonesian tribe in the island of Sulawesi, "Here, Living With Dead Bodies for Weeks-Or Years-Is Tradition | National Geographic," they keep the dead bodies with them and treat them as if they were still living. They do this until the family

can afford to throw a village party in honor of the deceased family member and their entrance to the world of the dead. It is their tradition to buy a buffalo and kill it, for they believe that the killing of a buffalo is the way they can enter the afterlife. They also interact with the dead corpse over the years, taking them out of their burial site to cherish and mourn them again. They get them up, clean them, dress them, and even feed them. This ceremony is called the ma'nene' ceremony and has been practiced for generations. For the Sulawesi people, this practice is within the norm and traditional, but to most of us, this would seem disrespectful and offensive. When experiencing these different traditional customs, we may experience some culture shock during traveling.

Culture Shock

Culture shock is when another person's way of life differs from your typical way of living and a sense of disorientation happens (Furnham and Bochner 1986). When traveling to different parts of the world to solve a disastrous problem and viewing cultural and living differences, it is important to be calm and collected because the forensic anthropologist may not be the only one experiencing these culture shocks. How does culture shock revolve around ethics? Well, being in a different living environment can cause a person to view those living environments in an ethnocentric point of view. However, visitors should not do or say harmful things about because they are

invading the space of others.

Culture shock can happen to the forensic anthropologist who travels around the world, but it can also happen to the native person of the foreign land. Seeing someone with different traditions and skills may make them skeptical about their work ethics. They may be scared that the foreigners are not properly doing their jobs or be scared that they may go against a belief or cultural tradition when handling the remains of the bodies. The main job of a forensic anthropologist is the proper handling of human remains. If an individual who is extremely traditional sees someone from the forensic team handling a person's or relatives' remains in a way they view to be wrong, they may be insulted and they might distrust the team that is handling the deceased body. Personally, they do not know the forensic team's intentions and may view what the forensic team is doing with the bodies as unethical, which would put the Forensic Anthropologist in a bad position. This is important to take into consideration in order to ensure that people do not take offense in the handling of the deceased body.

Conclusion

This essay was a brief explanation of how a traveling forensic anthropologist's work may be different from working in their own country and all the different challenges they may face throughout their work and travel. This paper also focused on the different challenges that Forensic Anthropologists may face throughout their traveling. It also focused on the ways

they can perceive these changes through the aspect of ethics and morality. Throughout the paper, different ways of respecting other cultures and their differences was explained. It is important to consider ethical handling of dead bodies and to ensure proper procedures are in place to deal with natural disasters. Hopefully, this essay can help those individuals who are trying to learn the different challenges that are faced in the field of caring for massive destruction sites and caring for the dead and living individuals who were affected.

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Human Remains After Infectious Outbreaks

Nicole Simbulan



"My name is Nicole, and I am a Clinical Laboratory Science student minoring in Anthropology. My passion for helping others and studying human health and culture led me to pursue a college education. This research on human remains pertaining to infectious diseases was especially inspired by the recurring epidemics happening worldwide. With clinical laboratory science and anthropology, I hope to continue research on infectious diseases pertaining to certain parts of the world, especially for the Centers for Disease Control (CDC)."

Introduction

Natural disasters impact a human population on every level, from infrastructure and business to familial bonds, and this damage continues long after a disaster occurs. People must repair not just infrastructure damages, but also physical, emotional, psychological, social, & political structures. Disasters can be deadly, causing excessive numbers of fatalities when they occur and are not adequately prepared for. Sadly, there is no comprehensive prevention or preparation because it often costs too much money to prepare for the highest intensity events, which are considered the least likely to occur. Socially, many worry about the actual disaster and services for the survivors, but there is not much discussion about what happens to the remains of the deceased after a disaster. Dealing with any amount of death during emergencies is the most difficult aspect especially if the death was caused from a highly infectious disease like Ebola. Infectious outbreaks require a certain urgency when identifying and recovering human remains

because of its ability to transmit diseases to others (WHO 2004). The loss of even a single life is devastating, but mass fatalities cause a collection of emotional damage. Fortunately, there are protocols provided by many accredited organizations for the management of dead bodies after disasters developed in response to past disasters.

Disasters Globally, there are various types of disasters: geological processes, atmospheric hazards, human-caused disasters, and infectious outbreaks (SAMHSA, n.d.).

Geological processes, also known as natural disasters, include hurricanes, floods, tsunamis, tornadoes, earthquakes, landslides, avalanches, wildfires, droughts, volcanic eruptions, and more (SAMHSA, n.d.). Floods are one of the most common disasters that occur globally making up roughly 40% of all documented disaster cases (Kouadio Aljunid et. al 2014).

Atmospheric hazards include heat waves, severe snowstorms, and droughts, which are popularly associated with weather and climate disruptions and may last much longer than geological processes, that tend to be more constrained temporally (Kouadio, Aljunid et. al 2014). In contrast, human-caused disasters range from infrastructure to industrial accidents, such as car accidents, acts of shootings, terrorism, and other mass violence (SAMHSA, n.d.). Human-caused disasters are popularly known to cause the most psychological damage because they are either designed to do that (i.e., terrorism), or they undermine the public's trust in government (i.e, a bridge collapse due to poor

maintenance). Another type of disaster that can occur on a larger scale is epidemics of infectious diseases. Over the course of centuries, infectious agents are one of the most difficult disasters to encounter. The amount of infectious agents that affect human beings are nearly infinite. Bacteria and viruses are a select few that have historically caused damaged globally, as parasites are often constrained to certain environments and intermediary hosts. Tiny creatures may cause endemics and epidemics throughout a population. Endemic is medically defined as “a disease that is constantly present in a certain geographic area or in a certain group of people” (Cancer, n.d.). An endemic disease popularly known is malaria, which is regularly present in countries with high humidity, frequent rainfall, and increased temperature (CDC, n.d.). Transmission of malaria does not usually occur in high altitudes with circulating colder seasons (CDC, n.d.). Since it is geographically prevalent in a localized area, malaria is an endemic disease, whereas epidemic is expressed as a “widespread occurrence of an infectious disease in a community at a particular time” (Dictionary.com, n.d.). The main difference is the time point. Epidemics are often new diseases to the population in question, so they are popularly publicized as outbreaks. For example, the most recent 2018 Ebola Outbreak in the Democratic Republic of the Congo has spread to nearly 1.2 million people (CDC, n.d.). In contrast, according to The World Health Organization, “a pandemic is the

worldwide spread of a new disease” (WHO, n.d.). It is essentially an epidemic on a much larger scale. This is possibly the worst case because of its foreign emergence worldwide. Despite of the difference in disease incidence, all cases create a massive catastrophe within a population. Mass fatalities arise with every disaster.

The Ebola Outbreak

The Ebola virus disease or EVD, has been causing continuous outbreak worldwide. The most recent cases were reported from the Democratic Republic of the Congo. As of February 2019, seventy-nine new cases rose from various areas in the country (WHO, n.d.). Unfortunately, health workers in the area are also catching the deadly virus. Ebola, or the Ebola virus disease is caused by a specific infectious microorganism. It is transmitted through direct contact through body fluids, contaminated objects such as needles, infected animals, and sexual contact (CDC, n.d.). Luckily, it is not transmitted through food or air (CDC, n.d.). When a person is exposed to the virus, symptoms will arise after eight to ten days of exposure as the virus replicates in the hosts’ cells (CDC, n.d.). It is first recognized as a “really bad flu,” but more symptoms will follow, such as fever, muscle pain, overall body weakness, severe headache, diarrhea, abdominal pain, and hemorrhage (CDC, n.d.). The Centers for Disease Control claim that they are constantly monitoring the areas containing the Ebola outbreak in the Democratic Republic of Congo through

“surveillance, laboratory testing, contact tracing, infection control, border health screening, data management, risk communication and health education, vaccination, and logistics” (CDC, n.d.). Unfortunately, these services are not sufficient enough to prevent such an outbreak. As of March 24, 2019, the total cases reported roughly 1,000 with deaths of 625 (CDC 2019). The amount of deaths from EVD has forced organizations like the Centers for Disease Control, World Health Organization, The United Nations, and more to collaborate on how to handle the humans remains and to protect the survivors.

Human Decomposition

Handling human remains after a disaster can be challenging. The importance of body recovery is a heavy task but must be dealt with as quickly as possible following the disaster. The sooner a body is recovered, the sooner an identification is made because a dead body begins to deteriorate roughly around four minutes after death (Vass, n.d.). After a person dies, his or her body will become pale within the first half hour from the sudden stop of respiratory and cardiac function known as pallor mortis (Schafer 1999). At this stage, blood is no longer pumping to the skin capillaries and through organs (Schafer 1999). Algor mortis follows, with the body temperature reaching at an ambient stage. For example, if the body died in a cold environment, the body’s temperature will decrease and vice versa (Vass, n.d.). As rigor

mortis occurs, the body stiffens within the first two to six hours because of chemical changes and increased acidity in the body, causing physical transformations to the muscular system (Vass, n.d.). Lastly, livor mortis strikes at eight to twelve hours after death with the blood finally settling in the body. Physically, this is shown as purple or blue staining depending on how the body was positioned at death (Vass, n.d.). Next is putrefaction, which is the breakdown of the body's proteins and soft tissues followed with the full decomposition of the human remains (Vass, n.d.). At this rate, the rest of the body's organic substance starts to lyse or rupture (Vass, n.d.). The breakdown of the body's normal flora containing microorganisms result in the formation of gases and liquids as byproducts, along with other chemical changes (Vass, n.d.). The stages of death occur naturally, but the speed at which it occurs is determined by the external factors surrounding it.

The environment in which a body died in influences its body decomposition rate heavily. Factors such as moisture, overall temperature, scavenger activity, fat content, and microbes affect the rate of human decomposition (Vass, n.d.). In warm and tropical environments, decomposition can occur within a matter of days. Therefore, time is of the essence when attempting to diagnosis an outbreak and properly identify and remove bodies for the sake of loved ones and the health of the local community.

Disposal of Dead Bodies Despite of the number of fatalities, the main priority is the health of the remaining survivors. Any search and rescue of the missing or recovery of dead bodies are halted until all living persons are accounted for first – if the body is not infected (Reed, Fisher, n.d.). According to The World Health Organization's technical note on Disposal of Dead Bodies in Emergency Conditions, "The handling of large numbers of dead bodies can have a serious impact on the mental health of members of the recovery team. The effects can take a variety of forms and may occur immediately after the event or much later (Reed, Fisher, n.d.). In other words, the first step in recovering human remains in emergency conditions is the gathering of a team and volunteers who are able to handle such a job. In any case of a large disaster with an increased amount of fatalities, health officials volunteer to aid for recovering bodies or missing persons. In the instance where the emergency situation was not caused by a medical epidemic, the bodies of the dead are collected, but there is a decreased urgency for the disposal of dead bodies since there is not risk of transmitting an infectious disease. The note emphasizes that,

"Contrary to common belief, there is no medical evidence to suggest that large numbers of dead bodies, in themselves, cause disease or epidemics. Humans originating from traumatic events (natural disasters, accidents or warfare) do not represent a health hazard. The only situation where there is a health risk is when communicable disease has been the cause of the fatalities" (WHO, n.d.).

There are various protocols regarding the disposal of dead bodies, depending on the nature of the disaster or death. In deaths unrelated to medical epidemics, the first crucial step to human remains collection is providing the workforce with the proper protective equipment, or PPE, needed before moving forward. This may include, but is not limited to, gloves, boots, first aid kits, masks, and vaccination. Vaccination protects the worker from any virus that the dead may have, even if that was not the case for the death itself, because bloodborne diseases are easily transmittable even after death (CDC, n.d.). With the proper tools, body recovery is followed through with the collection of body parts, such as arms and legs. Usually, if the limbs are severed, they are bagged separately but kept together because it is not certain that those limbs belong to the same body (WHO, n.d.). It is also beneficial to keep personal belongings with the body recovered because this will eventually assist in proper identification. According to WHO, “Bodies should be placed in body bags. If these are not available, use plastic sheets, shrouds, or other locally-available materials” (WHO, n.d.). The proper use of bags when collecting bodies will potentially prevent rapid decomposition because it conceals the body from external factors (i.e. humidity and scavengers) (WHO, n.d.). Subsequently, the items collected, including personal belongings and body parts, are labeled with matching reference numbers (WHO, n.d.). This labeling system ensures

that nothing is lost throughout transportation, and is also a form of chain of evidence. Identification labels are not removed until relatives collect the body and personal belongings (WHO, n.d.). During this process, temporary storage is essential because the bodies are not transported to the morgue right away. As stated before, decomposition continues no matter the circumstance, so temporary storage is needed to slow down the process. This is usually done under two degrees to four degrees centigrade refrigeration until the body is identified and claimed by family members (WHO, n.d.). Refrigerated trucks are used to transport around fifty bodies if the disaster has caused such a high casualty (WHO, n.d.). The bodies are then transported to the coroner’s office, where they are recorded individually and photographed (WHO, n.d.). If the body is too decomposed, DNA testing or dental records are obtained for positive identification (WHO, n.d.). The process of recovering dead bodies unrelated to medical epidemics are less urgent than those with infectious diseases.

The procedure for recovering human remains related to outbreak illnesses require more urgency. The World Health Organization and Pan American Health Organization has collaborated to strategize a manual on the Management of Dead Bodies in Disaster Situations. According to the manual, “...in areas where certain diseases are endemic, the disposal of bodies many become a priority” (WHO 2004). Care is needed in order to

dispose of the dead bodies because certain vectors, such as flies, rodents, and fleas, are able to transmit the infectious agents from the corpse (WHO 2004). The improper methods and lack of safety for handling the infected human remains increase the spread of diseases (WHO 2004). For example, if the decomposing body comes into contact with a body of water or a health worker with a minor abrasion, the disease is easily transmittable (WHO 2004). The World Health Organization has suggested specific measures to manage how dead bodies that were in contact with infectious agents are handled, including using a chlorine-based reagent to disinfect the body and limiting contact with the dead body and animals because animals can act as a carrier for certain agents (WHO 2004). Poor sanitation and contamination is the main cause of the spread of disease from an infected body, but this is limited through proper precautions. Table 1.1 provided by the WHO lists the possible risks of human corpses. The possible bacterial and viral infections listed above are some of the common infections that humans can have. The manual from WHO explains that, “it has been verified that the human

immunodeficiency virus (HIV) can survive for 16 days in a corpse, and at temperatures as low as 2°C” (WHO 2004). This poses a grave threat to the health workers that are handling the remains because of the severity and prevalence of the agents. Tuberculosis, however, is highly contagious. This bacteria is transmitted through respiratory droplets (WHO 2004). The manual suggests that,

“...[Tuberculosis] can pose a hazard especially during autopsy or handling of the body when air is exhaled from the respiratory tract. Several simple techniques dramatically reduce the risk of contagion from this disease. These include placing a cloth over the mouth of the body when it is being handled to prevent the escape of air, and ensuring adequate ventilation in the area chosen as a temporary morgue, especially when there are large numbers of corpses” (WHO 2004).

In this case of respiratory-transmitted disease, extra proper protective equipment must be taken at all times.

Depending on the infectious agent, there are various protocols in handling the human corpse because of the nature of the infection. Various bacterium and viruses have diverse ways of survival in a host and transmission pathways (CDC, n.d.). They are able to

Bacterial Infections	Viral Infections
Tuberculosis Streptococcal infections Gastrointestinal infections Meningitis and septicemia produced by meningococcus	Gastrointestinal infections Creutzfeldt-Jakob disease (“mad cow” disease) Hepatitis B Hepatitis C HIV infection Hemorrhagic fever

Table 1.1: Possible Risks from Human Corpses

transmit through respiratory droplets, contaminated food and water, and bloodborne (CDC, n.d.). Not all have the same characteristics, therefore it is crucial to handle the human remains that were caused from infectious outbreaks with proper equipment and precaution.

The Modernity of the Black Death

Infectious outbreaks are still present to this day. The Black Death was an infamous bubonic plague caused by the bacteria, *Yersinia pestis*, dating back in the mid-1300's (History 2019). The plague originating from China killed roughly 20 million people, making its way around Europe so easily from ship voyages (History 2019). At the time, doctors did not understand the physiology of this mysterious instant death that led most to revert to bloodletting and boil-lancing as treatments (History 2019). Both techniques were unsanitary, and they likely spread the disease more than treating it. The bacteria itself cycles through humans and rodents like squirrels, mice, and rats, by using fleas as living reservoirs (CDC 2018). *Yersinia pestis* is transmitted to humans through direct contact with contaminated fluid or tissue, respiratory droplets (i.e. coughing and sneezing), flea bites, and even food (CDC 2018). Early onset symptoms include the usual fever, chills, and muscle weakness, but a severe form of the plague causes swollen lymph nodes, known as buboes (CDC 2018). This deadly plague wiped out roughly sixty

percent of Europe's population, so severe that there were not enough survivors to bury the dead (CDC 2018; Gross 1995). The doctors that handled much of the patients back in the mid-1300's are known for their bird-like beak mask to protect themselves from what they mistakenly believed as an airborne disease (White 2014). The popular accessory was a form of protective equipment to keep themselves from infection. The 'beak mask' became an iconic symbol of the Black Death even to this day.

Unfortunately, the bubonic plague has struck again. For people living in the twenty-first century, it is surprising that a medieval bacterium has made its course again, but in reality, it never disappeared. The same illness that killed millions of people in the 1300s killed a 38-year-old man and his 37-year-old wife after they reportedly hunted and ate raw marmots, a type of large rodents that carry *Yersinia pestis* (Bichell, Schreiber, 2019). Culturally, Mongolians believe that this practice is good for their health (Bichell, Schreiber, 2019). A week later, the couple was infected, the man died from extreme fever and chills, whereas the wife was taken to the hospital where she continuously vomited blood and eventually passed from toxic shock (Chiu 2019). After the pair died from the bacterium, health authorities demanded an immediate quarantine of those who were in direct contact with the couple or those surrounding the area including visiting tourists and locals (Scutti 2019). A week later, the

quarantine was lifted because the patients were given antibiotics immediately and had been continuously monitored for the week (BBC 2019). The immediate cause for this quarantine was because of the bacteria's ability to transmit to other hosts so rapidly. Decomposing bodies that died from natural causes such as accidents and disasters cannot transmit diseases. According to the World Health Organization's manual of Disposal of Dead Bodies in Emergency Conditions, "The only situation where there is a health risk is when communicable disease has been the cause of the fatalities" (WHO, n.d.). In this recent case, the deadly bubonic plague caused the death of a couple, therefore the bodies were taken care of right away as well as any living persons who were in near contact. Even to this day, smaller or large-scaled outbreaks are still present.

Conclusion

The severity of disasters worldwide has caused many deaths over time. These catastrophes are highly publicized, but what happens to those who passed away are rarely discussed. In a case of mass fatalities, it is not only crucial to protect the living, but also the human remains. Deaths caused from infectious outbreaks are especially difficult because of the bodies' ability to transmit to others, but protocols provided by various organizations will ease the process of urgency.

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An Analysis of Cerro Sechín's Iconography and its Purpose

Michelle L. Sov



My name is Michelle Sov, and I am an Anthropology major entering my Senior year at California State University, Dominguez Hills. I chose to research Cerro Sechín's iconography because I wanted to know why it existed. They are obviously human-made, but were they just ornamentation? Did they serve a purpose? What kind of purpose? My curiosity and questions like these are what motivate me in my studies and research."

Introduction

The site of Cerro Sechín is located on a granite hillside of the Casma Valley in Northern Peru. Discovered in 1937 by Peruvian archaeologist, Julio C. Tello, Cerro Sechín was initially thought to be a Chavín-influenced site. However, its chronology has been widely debated by archaeologists. Tello proposed that Cerro Sechín dated to the late Chavín horizon. The site was also believed to have been built at the start of the Early Horizon-Formative times (Arnold and Hastorf 2008). Absolute dating of the site comes largely from a test pit that was originally designed to check the thickness of the clay floors in Cerro Sechín's western passage (Samaniego et al. 2008). The test pit is located adjacent to the west wall, and radiocarbon dating of charcoal samples from its final layer dated to about 1870 B.C. (Samaniego et al. 2008). Examination of early deposits indicate

that major construction of the site began between 2300 and 2000 B.C. (Moore 2014). Since its discovery, Cerro Sechín's iconography has been the subject of intense debate regarding the purpose of the site (Moore 1996). Cerro Sechín is most known for its three hundred stone carvings depicting warriors, dismembered body parts, and decapitated victims. Excavations revolve around the central building and covers an area of about 52.7 x 52.7 meters. The construction is square-shaped with rounded corners, and is built with conical adobes. Bas-reliefs, which depict the graphic and violent imagery that Cerro Sechín is known for, surrounds the construction. A main entrance staircase leads to the inner chambers of the construct. The central chamber in the interior of the site measures 5.65 x 5.65 meters, and its north-facing entrance was flanked by two painted feline figures. The site, despite being well-known, has not been fully excavated. A drawing of the Cerro Sechín site (Figure 1), shows that the outside walls of the central structure are excavated, but a large portion of its interior and areas surrounding the central structure are still unexcavated.

Background to the Problem

Since the discovery of Cerro Sechín, there has been much debate about the iconography found on the site and what it stands for. Consequently, archaeologists also debate about what the site was used for. When Tello discovered the site, his first impression was that the stones had been hauled from an older

building, perhaps from the Sechín Alto Temple (Tello 1943). Tello believed that the stones were repurposed to form Cerro Sechín's walls and may not have been significant to builders as anything besides building material or ornamentation. He also noted that the images on the stones were uniformly carved, which indicates that they were carved by the same person or people trained to the same standards (Tello 1943).

Later excavations in Cerro Sechín created more debate. Since the images carved onto the walls at Cerro Sechín depict warrior-like figures along with disemboweled victims and human body parts, hypotheses for the meaning of these images—and the use of these meanings to determine the purpose of the site—abounded. One hypothesis is that the images, and therefore the site, is a commemoration of a great battle, whether real or mythological in nature. There is also speculation that the site was used as a site of medical learning because of the detailed images of human viscera and other body parts. Still another hypothesis is that the site was used for ritual purposes, with the images carved into the walls depicting sacrificial ceremonies. Another interpretation of one of the figures (Figure 2) made by zoologists indicate that the images are that of toad spawn (Wickler and Seibt 1982), though there is no evidence to support such a suggestion.

Analysis/Discussion

To conduct my research, I read and compared published works by archaeologists

who have studied at Cerro Sechín. I began with Tello's research as he discovered the site. Tello believed the site had been influenced by Chavín. This may be, in part, because of the felines that are painted near the entrance to the central chamber. Chavín art does place an importance on the feline motif, but it is drawn in a distinct style which includes a round eccentric eye and a mouth with rounded corners and crossing fangs (Kan 1972). Figure 3, an example of a feline sculpture from Chavín de Huantar, appears to be different from the drawing in Figure 4, an example of the painted feline found at Cerro Sechín. Although part of the feline at Cerro Sechín is destroyed, what can be seen does not share the Chavín style. Tello also described some carved figures to be half-human and half-feline beings, which was later dismissed. Subsequent radiocarbon dating also disproves the idea that Cerro Sechín was influenced by Chavín, since Cerro Sechín was shown to predate Chavín. Tello also hypothesized that the stones that make up Cerro Sechín were repurposed from Sechín Alto. He reasoned that because the monoliths were carelessly placed and found at different levels of the construction, it meant that the builders did not attach too much significance to the stones (Tello 1943). Tello also found that the stones come from the quarries adjoining the temple construction and mentioned that the material had been used by the ancients in their buildings and sculptures (Tello 1943). At the time that Tello discovered the Cerro Sechín

site, however, he was only able to uncover ninety-six monoliths. The total number of carvings were uncovered over time and was done in sections (Salt 2017). Because of this, early assumptions were not based on the information that was uncovered since its discovery. Tello noted a symmetry found in the stone carvings that mirrored each other on the east and west wall feature (Figure 5). This in itself indicates that the stones were not placed without any meaning to its builders. Later excavations would uncover the rest of the monoliths and the fact that about two-thirds of the stone friezes were found in situ (Salt 2017).

Another hypothesis for the interpretation of Cerro Sechín's stone carvings is that its graphic scenes are a commemoration of a great battle. There are depictions of warrior-like figures (Figure 6) with elaborate girdles and fez-like hats. These figures have open eyes and carry staffs or club-like objects that are elaborate in design. In between these warrior figures are images of the decapitated heads (Figures 7 and 8) and dismembered body parts of the purported victims (Figure 9). The images of the decapitated heads show the victims with closed eyes and grimaces. The decapitated heads in Figure 7 are missing the top portion of the head and features what seems to be exposed brain matter. Figure 9 depicts a victim whose body has been cut in half with entrails descending from the upper half of its body. Unlike the images of the warrior figure, the victim figures are shown

wearing loincloths with no elaborate designs. The interpretation of warfare is the most popular because of the obvious violence found in the iconography. Archaeologists such as Thomas and Shelia Pozorski and Lorenzo Samaniego argued that the iconography represent a commemoration of a battle (Salt 2017). The images of the elaborately-dressed warrior figures are interspersed with the mutilated remains of victims and could be a display of power. No evidence of a battle, which could include a large burial ground or any debris of warfare, are found near the Cerro Sechín site, but this fact does not preclude the site being a monument for a battle that took place elsewhere.

Another related hypothesis is that the Cerro Sechín site is a commemoration of a mythological battle. Archaeologist Richard Burger suggests that the carvings depicted a mythological battle won by ancestral heroes (Salt 2017). Burger writes that the scenes depicted on the walls of Cerro Sechín depict a military procession, but also points out that there is a lack of animal or other supernatural iconography that would indicate the representation of mythological or supernatural beings (Burger 1997). This lack of supernatural motifs indicate that the images carved into the stone friezes are human. Burger acknowledges this fact in his article, but also mentions that the stone friezes indicate the role that violence played in the religious and political ideology of ancient societies (Burger 1997). He still interprets the

site as a monument to the warriors and that the site commemorates an at least semi-mythical battle. However, because of the lack of supernatural motifs, it is unlikely that this would be the commemoration of a mythological battle. The vicious imagery of disemboweled human remains at Cerro Sechín, coupled with the rarity of non-human motifs in the iconography suggests that if this was a commemoration of a battle, it would be that of a human one. What is important to note is that the imagery at Cerro Sechín, despite being very violent in nature, does not depict any kind of a fight.

Cerro Sechín has also been hypothesized to have been the site of medical study and research. This hypothesis largely stems from the very detailed imagery of human body parts, including vertebrae, intestines, and other viscera (Figures 10 and 11). The images are considered to be anatomically proportional to the human body, a fact used to support the idea that the site was a medical learning center. It was speculated that ancient people used these carved images as study material due to the attention to detail. An issue with this hypothesis is that the images on the walls of Cerro Sechín are very violent in nature. The obviously decapitated heads and dismembered bodies portray a kind of violence that does not make sense if the images are intended as a medical resource. The presence of the club-wielding figures also cannot be explained if the site was a medical learning center. Also, while the carvings are very detailed, much of

that detail is concentrated on the faces and their expressions. Very little detail is found of the bodies' torsos. It is unlikely, then, that the site was intended to be or used as an ancient center for medical learning.

An interesting hypothesis regarding Cerro Sechín's iconography is that the site is a commemoration of a ritual practice known as *tinku*. Archaeologist Erica Hill posits that the imagery found at Cerro Sechín represented a *tinku*, which she describes as an Andean ritual battle that takes place on certain holidays (Hill 2004). This is a physical and ceremonial battle between two moieties, each with a different social status. The *tinku* battle is intended to provide balance for the moieties. Hill suggests that this would explain the sort of symmetry found in Cerro Sechín, which she argues represents the duality of the creation story where two warrior groups fought in mythic time, thus creating the world (Hill 2004). Further research of the *tinku* ritual revealed a different legend. A *tinku* is the place where opposing streams encounter each other. In one Paititi legend, an Incan party passed through a *tinku* and left one of their party, a petrified perpetually urinating girl, behind (Allen 2002). Urination was associated with times and places of transition in these legends (Allen 2002). In Andean *tinku* ritual battles, two moieties often fight until blood is shed in order to ensure agricultural abundance and social order (Allen 2002). This seems to be the kind of ritual battle that Hill writes about. While Cerro Sechín's imagery could represent

a possible *tinku*, there is a lack of iconography that would indicate either of the legends that explain the *tinku*. There are no supernatural motifs found on the outside walls of Cerro Sechín, and while there is a symmetry between the east and west walls, there is no depiction of a fight. There is also a lack of water motifs, which could have represented the meaning of the word *tinku*.

Perhaps the most plausible hypothesis is that Cerro Sechín was a ceremonial structure that was used for ritual practices, including sacrificial ceremonies. Although the popular interpretation of Cerro Sechín's iconography is that it commemorates a victorious battle, careful examination of the images indicates a procession of sorts. From the north-facing main staircase, which is flanked by large banners, a symmetrical procession begins and ends towards the rear entrance on the south wall (Figure 5). While it was argued that this could be an after-battle parade of sorts (Burger 1997), the procession also seems like it could be largely ceremonial. The warrior-like figures could be priests due to the elaborate headwear and staffs and the lack of weaponry found on most of the figures. The lack of weaponry could be explained by the argument that the procession took place after the battle and was a show of power. It still seems likely that if this were a commemoration of a battle, there would be more indication of weaponry or fighting involved in the iconography. This would especially be true if the procession was intended to be a show of power. For the most

part, the images on the outer wall of Cerro Sechín's central structure depict human figures. The only non-human figure on the outside walls are the banners, which possibly indicates the start of a procession, flanking the main staircase. Within the structure, however, painted felines flank the doorway to the central chamber. Although the exterior walls of the structure are very much human, the presence of feline and fish-like motifs indicate that the center chamber, at least, was used for a ceremonial purpose. The surrounding walls with its violent depictions of human body parts could, then, be a representation of the sacrificial victims that take part in the ritual sacrificial ceremonies in Cerro Sechín's inner chamber.

Summary

There are a wide variety of hypotheses regarding Cerro Sechín's iconography. Tello's hypothesis that Cerro Sechín was a Chavín-influenced site was believed for quite some time because the site remained largely unexcavated after Tello's initial discovery. Another hypothesis proposed by archaeologists after further excavation includes the site being a commemoration of a victorious battle, whether real or mythological. This hypothesis was a popular one and was supported by well-known archaeologists including the Pozorski's, Samaniego, and Burger. The site was also hypothesized to commemorate an Andean ritual *tinku* battle because of its symmetry and obvious

portrayals of bloodshed. The site's detailed and proportional depictions of human anatomy also led to the hypothesis that the site could have been used as an ancient medical learning center. The presence of the inner central chamber, along with the feline motifs at its doorway, indicate a ceremonial use for the site. The iconography on the walls of the central structure indicates that rituals probably had a human sacrificing component.

Conclusion

The iconography found at Cerro Sechín has been widely debated since its discovery, and with reason. Archaeologists have yet to agree on the purpose of the site, but evidence seems to indicate that the site was used as a ceremonial structure. Tello's initial hypothesis that the site was Chavín-influenced was later disproved by radiocarbon dating. He also argued that the site was constructed with the use of repurposed stones from Sechín Alto and that the stones were not significant to the builders, but later excavations invalidated this. His hypotheses were also based on a site that had yet to be fully excavated. The hypothesis that Cerro Sechín was used as a site for medical learning was interesting, but the images were not particularly clinical in nature. There is a clear violence in the iconography that makes it unlikely that the site was used as a medical reference. The hypothesis that the site represented a *tinku* ritual battle also seems unlikely as there is no depiction of actual fighting. If it were a representation of the

creation myth suggested by Hill, there would have been supernatural motifs to indicate the fight between two mythological warrior groups. The lack of fighting in the imagery is also why the site is unlikely to have been a commemoration of a battle, real or mythological. Though this was my initial hypothesis as well, the evidence seemed to indicate more that the site was used for ritual sacrifices, especially after taking the central chamber into consideration. The painted feline figures flanking the doorway to the central chamber indicate that the chamber was used for ceremonial purposes. It is especially important because it is one of the few non-human depictions found at the Cerro Sechín site. The site itself was built into a granite hillside and its detailed imagery on its outside walls indicate that the site was meant to be seen.

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Appendix

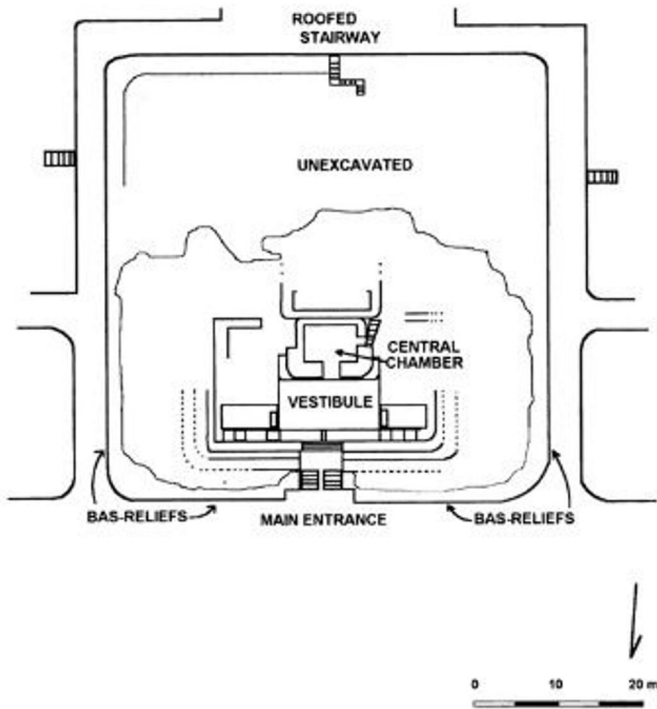


Figure 1. Plan of central structure at Cerro Sechin (Moore 1996)

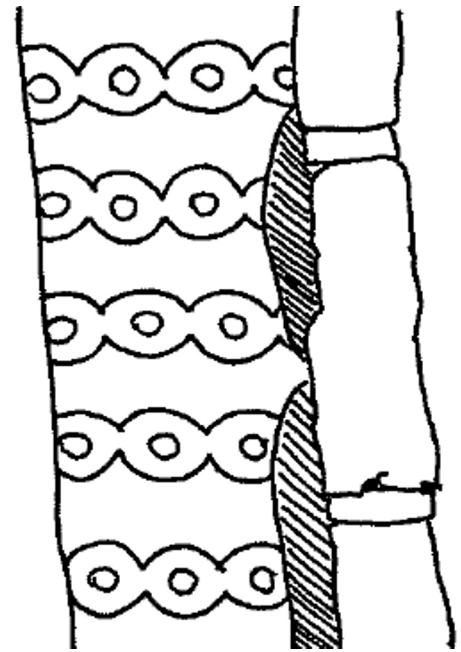


Figure 2. Monolith depiction eyeballs (taken from Salt 2017)

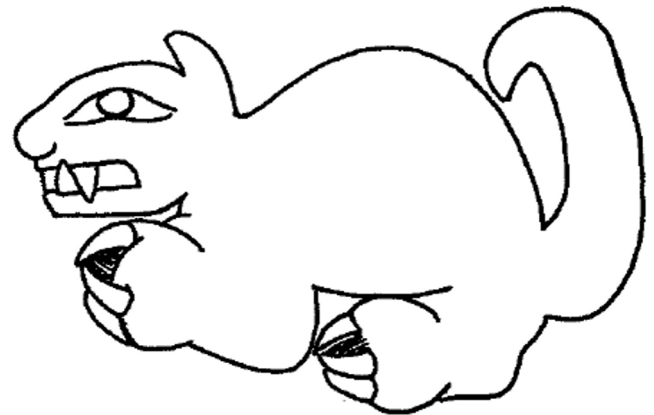
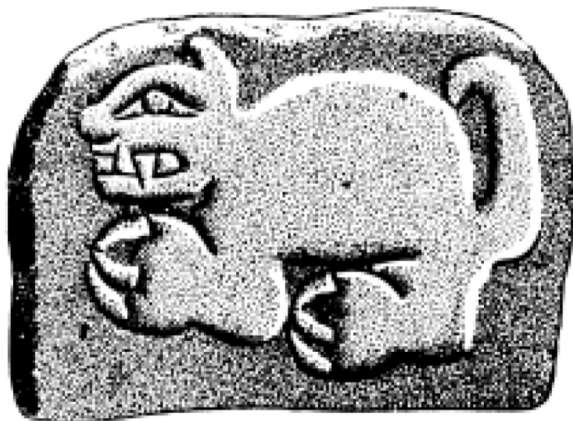


Figure 3. Chavin feline (Kan 1972)

Appendix



Figure 4. Drawing of painted feline next to the doorway of Cerro Sechin's inner central chamber (Kan 1972)

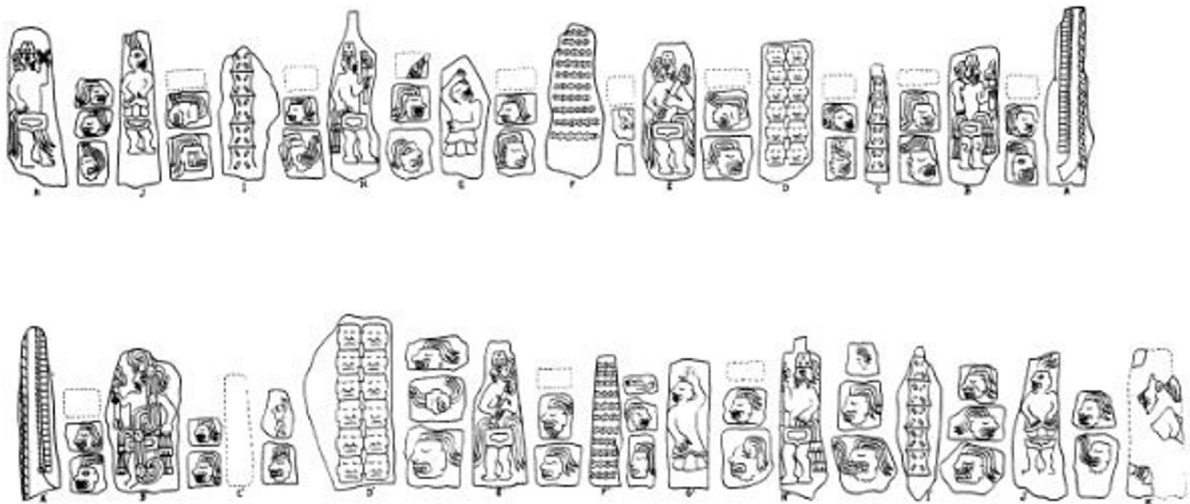


Figure 5. Drawing of Cerro Sechín's outer wall. Top: eastern wall beginning from banner on the right. Bottom: western wall beginning from banner on the left (Tello 1943)

Appendix

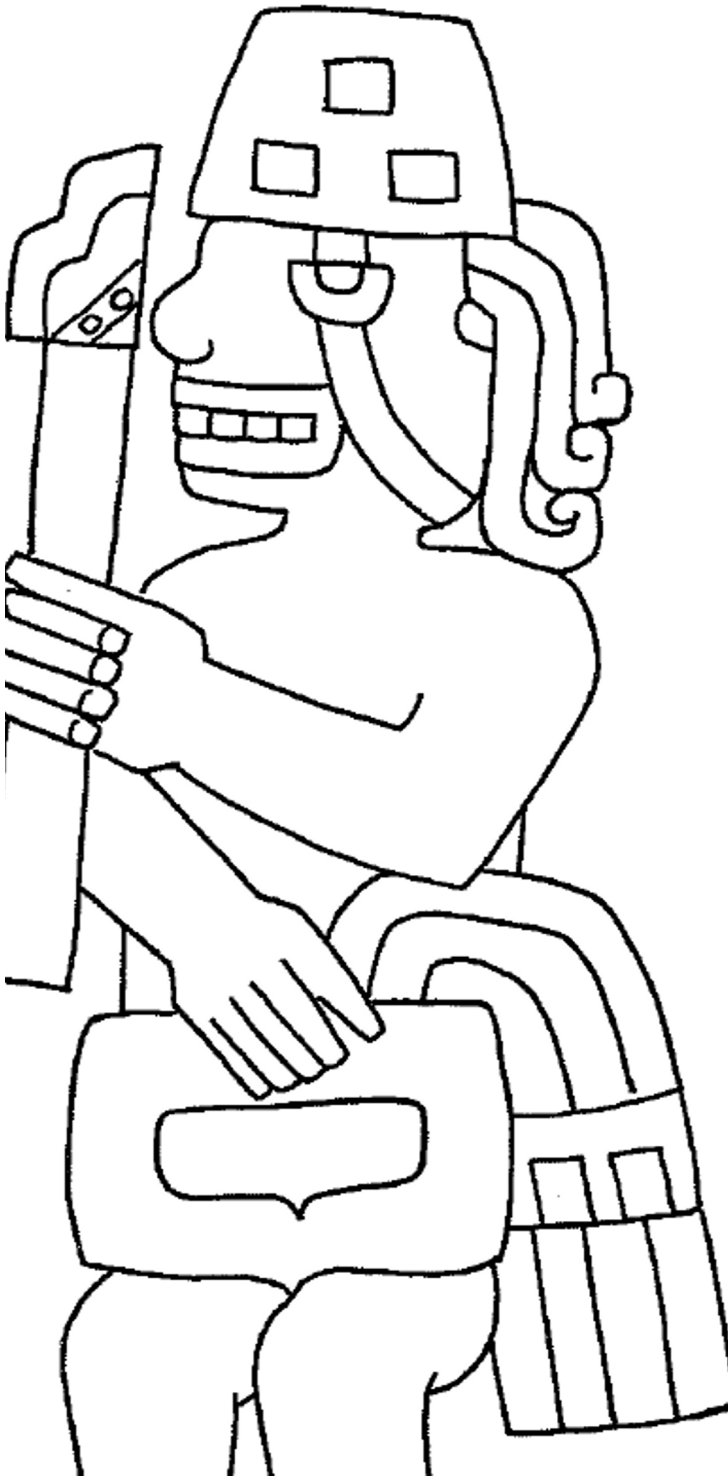


Figure 6. Depiction of warrior-priest figure (taken from Salt 2017)

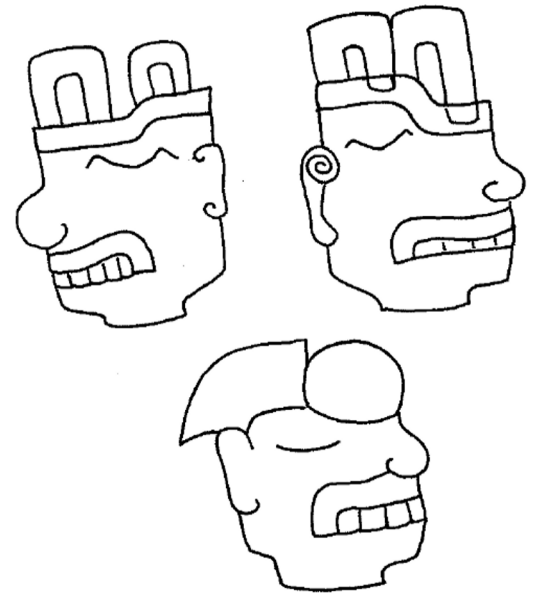


Figure 7. Monoliths depicting decapitated heads with brain matter (taken from Salt 2017)

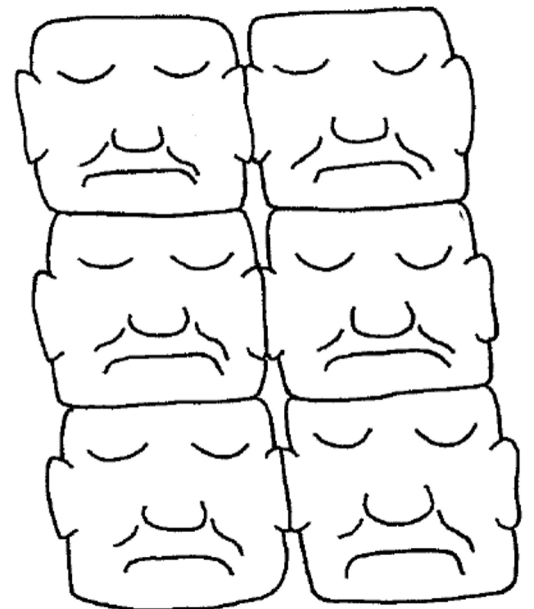


Figure 8. Monoliths of decapitated heads with eyes closed and mouths grimacing (taken from Salt 2017)

Appendix



Figure 9. Monolith of victim cut in half with entrails flowing from upper portion of body (taken from Salt 2017)

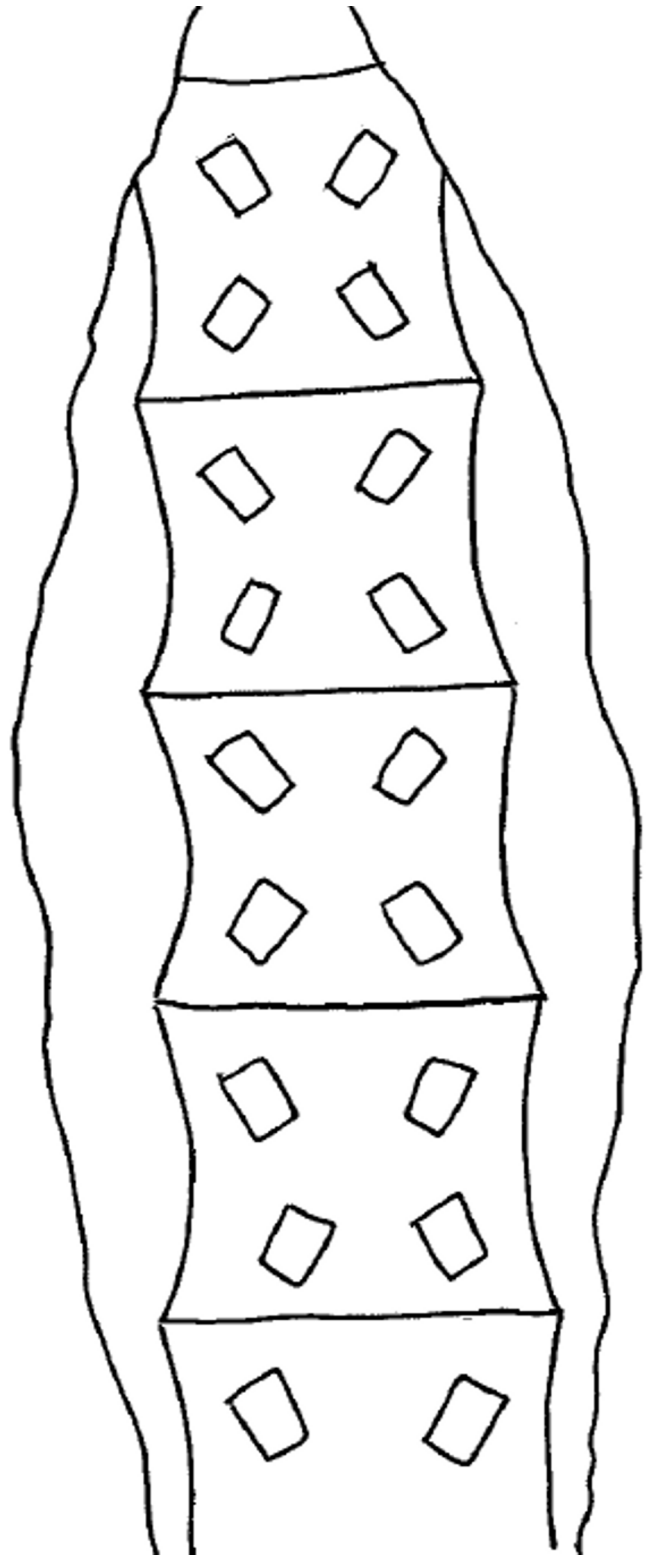


Figure 10. Monolith of vertebrae (taken from Salt 2017)

Appendix

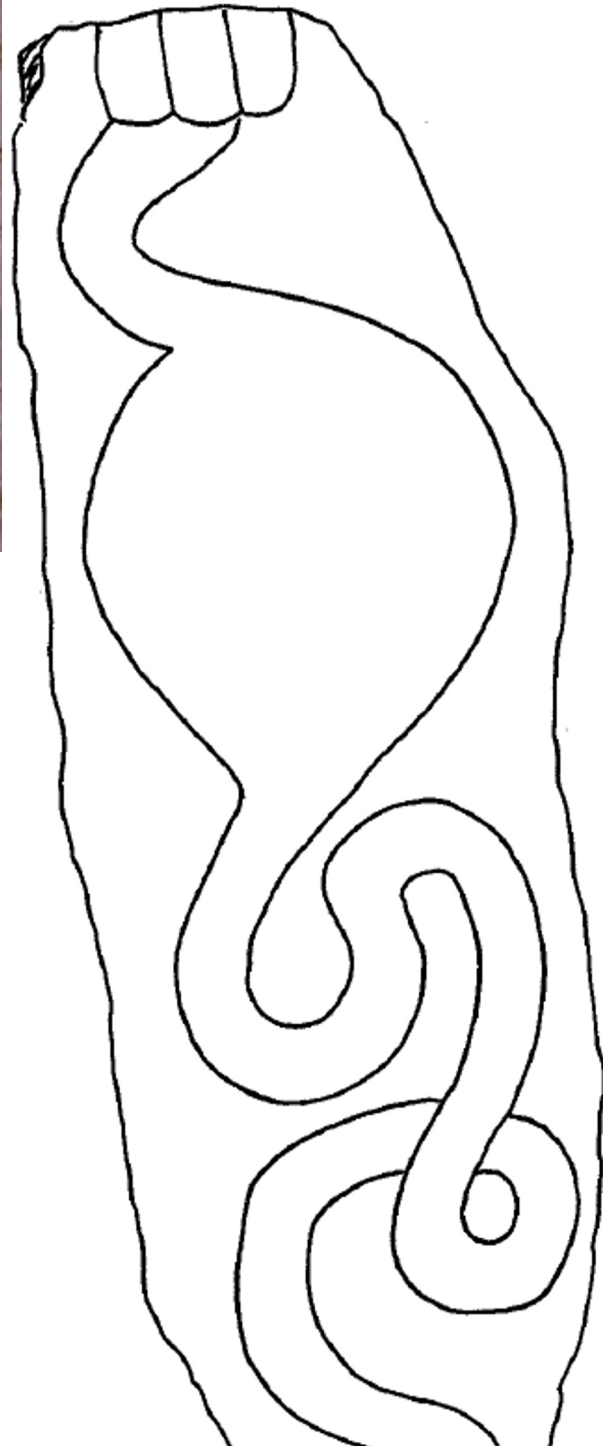


Figure 11. Monoliths of intestines on the left, and decapitated heads on the right (Salt 2017)

Arrival and Subsistence in Coastal Versus Continental North America

Sahara Vilchis



"My name is Sahara Vilchis, a current senior at CSUDH. My work at La Brea Tar Pits inspired me to do further research into the peopling of the Americas and analyze the changing environment of the New world as the climate gets warmer and ecology changes."

Introduction

The timing and nature of the arrival of humans into the New World can give us clues as to whether or not they were, in fact, the perpetrators of the megafaunal extinction in the Americas. Genetic studies reveal a single wave migration from East Asia and subsequent isolation in Beringia—a land bridge that once connected Siberia and Alaska—for several millennia (Raghavan 2015), and they carried the four major Pan American founding haplotypes (Tamm et al. 2007). New studies are also suggesting an earlier arrival than previously anticipated at 11-12,000 before present (bp). Since the discovery of an archaeological site, Monteverde, which was found in South America and dated at approximately 14,000 years bp, scientists have been open to the possibility of a different migration route into the Americas

(Dillehay et al. 2015). Evidence of early aquatic technologies like shellfish hooks that were created by maritime human foragers reveals their hunting abilities on the coast (Des et al. 2017). Perhaps founding Native Americans did not need to extensively hunt land animals because they were already well adapted to utilizing marine resources.

It could be possible that at the time the continental megafauna were facing extinction, Paleoindians were relying on coastal resources instead, and the timing reflects coincidence, not causation. However, we are limited in our access to prehistoric coastal sites, as sea levels have risen considerably. This paper contextualizes zooarchaeological data gathered from La Brea Tar Pits, which aimed to identify a different cause for the megafauna extinction. By analyzing dates and locations of human populations entering the New World, there is question as to how and to what extent the Paleo Native Americans used resources from the coast and how this can be compared to the kill sites found inland.

Literary Analysis

The Clovis Culture (12-11,000 bp) is typified by fluted stone tool technologies and, until the 1990s, was believed to have been the first group of people that inhabited the New World (Braje et al. 2017). When sites present earlier carbon-dating (before 12,000 bp), they are often overlooked because they represent an earlier time than the Clovis, which does not fit the Clovis First Theory. The Clovis people

were hypothesized to have migrated through the ice-free corridor, which is thought to have opened at around 14,000 bp, though it was not habitable until around 12,000 bp (Anderson and Guillam 2000). Clark and colleagues (2014) explain that the ice-free corridor would not be biologically viable for the early humans. Environmental conditions, such as unproductive landscapes, lead more recent scientists to focus on the western coast of the Americas, as they would have been more environmentally suitable to human foraging (Clark et al. 2014).

Studies suggest that early humans had simple watercrafts to navigate coastal routes were found to be as early 25,000 bp in the western Pacific (Des et al. 2017). Evidence of humans in Australia at 65,000 bp (Davidson and Walquist 2017), suggests humans have had experience travelling by boat at large distances much earlier than previously thought. Additional studies are indicating that ancient humans of the late Pleistocene initially entered the New World along the eastern Pacific Rim (Surovell 2003). At the Pleistocene-Holocene boundary (10,000 bp), many large mammals had a rapidly declining population and were completely wiped out after humans arrived on the continent through the Bering Strait. Analyzing the timing of the human arrival into the New World and investigating the biotic resources they were using provides one line of inquiry into whether or not they were perpetrators of the subsequent continental megafaunal extinction.

The Clovis First Theory was the most widely accepted explanation for the peopling of the Americas, claiming that humans entered the Americas through an ice-bridge at around 12,000 bp. Paul Martin's overkill model, which claims that humans wiped out the New World megafauna through over hunting within 1,000 years (Surovell et al. 2015), comes from the Clovis-First theory. This paradigm dominated the ways in which we understood how the extinction occurred. However, new studies conducted after the discovery of the Monte Verde site found south of Chile date to 14,000 bp, suggests an earlier arrival along the Pacific Rim. Evidence of early human foragers along the Northern Pacific Coast at the Queen Charlotte islands carbon-date at 16,000 bp, revealing that they were hunting fish, birds, and sea mammals on their journey south (Hall et al. 2004). Other pre-Clovis sites along the North American coast include the Paisley Cave in southern Oregon, Orca Island, and Santa Rosa Island (Mackie et al 2013).

Genetic studies of mitochondrial DNA have shown a period of isolation and genetic diversification in Beringia before the Last Glacial Maximum at 20-15,000 bp (Tamm et al. 2007). Genomic divergence from East Asian ancestors and the split between two branches of major Native American subgroups, Athabascans and Amerindians, occurred no earlier than 23,000 bp (Raghavan 2015). Tamm and colleagues (2007) suggest two scenarios based on the archaeological dating of the evidence exhibiting Homo

sapiens in Northern Siberia at the Yana Rhinoceros Horn Site as early as 30,000 bp. The first is the Direct Colonization Model, which determines recent genomic changes just before Native American ancestors reached Beringia around 15,000 bp (Tamm et al. 2007). This genetic change was derived from a larger parent Asian population, which is hypothesized the presence of founding mtDNA haplotypes of members from both Northeast Asia and the Americas. According to Tamm and colleagues (2007), it presumes continuous movement into the Americas with major pulses of the Amerindian expansion and the much later Athabascan expansion. The Beringian Incubation Model is derived from different genetic evidence that the Amerindian and Athabascan groups were part of the same migration into Beringia and were in situ for approximately 8,000 years before splitting when the Amerindian group ventured further into North America (Raghavan 2015). The Athabascan group entered the rest of the North America much later.

Founding haplogroups, A, B, C, D and X are exhibited in the mtDNA diversity in the Americas. In the Greenburg et al. study (1986), three waves determined by language phylogenetic groups spread into the Americas. The Amerindians were part of the first wave and consisted of diverse language groups that are recognized today as Maya, Quechua, and Cherokee. The Na-Dene/Athabascan speakers occupied the Canadian Northwest, Alaska, Oregon, California and some parts of the

Southwestern part of the United States, mostly in Arizona (Greenburg et al. 1986).

Diné/Navajo and Apache speakers are a part of this group but share similarities in their languages with the Inuit speakers, further north. The Inuit speakers are part of the Aleut-Eskimo language group that is the last wave of people to migrate to the Americas. This wave occupied the arctic periphery and show shallow language internal divisions compared to the other two language groups (Greenburg et al. 1986). The paleo migrants are identified first by language, then by dentition, and finally by genes. However, scientists are determining the limits of placing the language phyla into three biological groups, and it has created some debate (Mazières 2011).

Studies on louse populations can retrieve even more detailed information on our migratory history because the evolutionary rate of these parasites are even faster than that of their host. In a study conducted by Ascunce and colleagues (2013), 450 American head lice were sequenced for mtDNA. Initially, haplogroups named A-D indicated more than one migratory wave in the peopling of the Americas, but four major mitochondrial haplogroups were identified from the Native American head lice and were renamed A2, B2, C1, and D1. These haplogroups confirm demographic expansion to the Americas at 20,000 bp for group B1 and 16,000 bp for haplogroup A. The vast majority of Native Americans descend from homogeneous Native American ancestral populations and perhaps

the Amerind expansion was demographically small and resulted in low genetic diversity.

Recovered louse eggs from Brazilian mummies were carbon dated at 10,000 years old, demonstrating the dominance of lice haplogroup A in South America by 95%.

The low amount of genetic diversity in early mtDNA samples suggests that founding populations were relatively small (Tamm et al. 2007). According to Joseph F. Powell (2005), there would have been small group sizes for the Paleoindians, a characteristic of nomadic Pleistocene foragers, which opposes the implicated population size of the Clovis-first megafaunal overkill model (Martin 1984). Density estimates with assumptions of 5,000 Paleoindians bands result in short-term effective population size of about 36-100 persons per group, though paleodemography has large amounts of variance (Steele et al. 1998; Powell and Neves, 1999). Powell (1997) conducted a Clovis first simulation to predict its hypothetical occurrence with population size of about 50 per group to support the overkill model. However, based on monomorphic phenotypic traits, such as upper shoveling incisors in founder populations, Powell claims that from the Clovis megafaunal overkill model approach, population sizes for Paleoindians have to be much larger to prevent genetic drift (Powell 2005). According to Powell (2005), “the drift hypothesis appears to account for the observations of phenotypic cranial facial and dental diversity in ancient humans in the

Americas without need to fall back on population replacement (Chatters et al. 1999) and multiple migration models (Greenburg et al. 1986).” With the combination of Steel et al.’s (1998) simulation of Paleoindian migration to the Americas and Powell’s (1997) genetic variance simulation, Powell concluded the genetic and phenotypic variance resulted in small population and subpopulation sizes.

The limited number of extinct mammals associated with human artifacts is not evidence of absence in the explanation of the extinction of the Pleistocene megafauna. Prehistoric hunters preyed on 6 of the 36 megafauna genera that went extinct around the dates of the Younger Dryas (YD) cooling, which include mammoths, mastodons, gomphothere, horses, camels, and ground sloths (Waters et al. 2015). The YD cooling is one of the most important paleoclimatic events for the purpose of this topic, dating at about 12,900 bp. After this occasion, there is no evidence of the remains of extinct megafauna and Clovis artifacts (Firestone et al. 2007). It has also been noted that an Extra Terrestrial (ET) event of one or more large, low-density meteors crashed in North America and is attributed to the YD cooling and the extinction of the megafauna (Firestone et al. 2007). In the Firestone et al. (2007) study, they noted that over 50 sites in North America exhibit a layer described as a “black mat.” This also coincides with the YD cooling and the extinction of 36 megafauna

genera, which may reflect catastrophic deposition. They argue that the extinction was too broad in geography and ecologically deep in species to support the over kill hypothesis. The paleoindian demography in Buchanan et al. (2008) study summed a probability of population bottleneck after the ET impact that was more pronounced in the Northern part of the Americas.

In the Waters and colleagues (2015) study, the butchered remains of seven horses and a camel at the Southern margin of the ice free corridor in Southwest Alberta, Canada are dated at 13,300 bp. Coupled with proboscidean (Mastodon and mammoth) and the other extinct megafaunal genera in the Americas, evidence of hunting on the Western hemisphere began at around 14,800-12,700 bp. Pleistocene humans globally hunted large mammals because they ensured worthwhile expenditure of time and energy, while also producing larger caloric returns per unit of resource (Surovell and Waguespack 2009). Remains of *Bison antiquus* dating back to 13,700 bp and found on Orca Island on the Northwest coast reveal that humans did indeed hunt this animal, based on butchery marks and spiral fracturing (Mackie et al. 2013). *Bison* was a frequently hunted mammal during the Late Pleistocene-Early Holocene boundary.

In La Brea Tar Pits, there is no evidence of human activity contemporaneous with mammoths or dire wolves. Many mammals, like the Western Horse and Yesterday’s camel, evolved in North America from about 50-45

million bp. The *Bison antiquus* originated in Asia and migrated to the New World about 250,000 bp (Scott 2009). The mammals listed above all became extinct toward the end of the Pleistocene, dating their existence to about 40-11,000 bp. Though mammals native to the Americas, such as horses, camels, mammoth, and many others are no longer present today, only one species mentioned above has given rise to an extant species: Bisons.

American bison are seen as aggressive and territorial towards ecological competitors, and, if ancient bison exhibited similar behaviors, it could have been difficult for other fauna to compete for resources. Isotopic markers indicate that bison generally have a wider variety of plant consumption compared to the specialized diet of the horses of the Pleistocene (Feranec et al. 2009), which could have given the newly evolving bison an advantage when there was a scarcity of highly sought-after plants. Extant bison and horses are considered grazers and often share about 80% of plants species in their diet (Abaturov 2017). The competition between these and other species could have caused a floral extinction of the paleoecosystem in La Brea. The warm climate and potential scarcity of preferred food lends further support to the idea that overkill is not a major contributor to the extinction of Pleistocene megafauna (Van et al. 1994). Feranec and colleagues (2009) found that individual bison had greater variability in carbon isotope values compared to values of the horses and camels, supporting

greater dietary flexibility. Horses in the Americas today are not native. They were brought over in the 16th century by Spaniards during colonization and were easily integrated into the environment of the New World despite their absence over many millennia.

While hunting was an important factor in the life of the first Americans, they were not exclusively hunting down large mammals. After the Last Glacial Maximum at approximately 26,000- 19,000 bp, the ice retreat caused sea levels to rise globally at about 130m (Clark et al. 2014). While many sites remain submerged, early archaeological records from along the Pacific coast show that humans made use of marine ecosystems by at least 25,000 bp in the western Pacific outside of North America (Des et al. 2017) and 16,000 bp along the Northwest coast of North America (Hall et al. 2004). Between 18-12,000 bp, global warming led to rising sea levels, which opened the coastal routes and eventually melted the continental ice sheets (Dixon 2001). In Des Lauries and colleagues' 2017 study, the oldest fishhook technologies range between 10,420-8,900 bp in Cerdos Island, Mexico; however, they found that well-contained archaeological records indicate human occupation prior to 13,000 bp. Seaworthy boats found on the mainland of California's Channel Islands dated to at least 13,000 bp, indicate that ancient maritime foragers occupied the area (Clark et al. 2014). Daisy cave, on San Miguel Island near Santa Barbara, radiocarbon dates at approximately

15,780 bp and indicate that people were utilizing coastal ecosystems (Surovell 2003).

South America was likely occupied starting between 15,000-13,500 bp through one single migration wave (Rothhammer and Dillehay 2009). Unlike the Clovis in North America, there was no single culture that dominated in South America, and several factors, including geographic barriers to human migration, climatic changes, shifts in resource, innovative technologies, etc., account for early diversity (Rothhammer and Dillehay 2009). Dillehay et al. (2015) presents two different perspectives to the stone tool technologies in South America. While the first perspective interprets Clovis bifacial technologies reaching South America at approximately 13,000 bp in the form of fishtail projectile points, the second interpretation is that North and South America tool assemblages are of different adaptations to the different environmental and cultural conditions. According to Goebel and colleagues (2008), migration from Beringia to the Americas likely occurred around 16,500 bp, and archaeological sites in South America date as early as 15,000 bp; however, Dillehay and colleagues (2015) proposes possible ephemeral human activity as early as 19,000 bp.

The Chinchihuapi creek in South America formed at approximately 15,000 years ago. MVII, a campsite on the north terrace of the creek shows remains of tent-like dwellings, hearths, human footprints, economic plants, wood, reed, bone, and stone artifacts (Dillehay

et al. 2015). Dillehay and colleagues (2015) set out to explore the previously unknown archaeological deposits, investigate the long time span between sites, and further assess the geological setting of the sites by applying optically stimulated luminescence (OSL), and micro- and macro- botanical analysis, as well as other techniques.

Ancient humans left Paleolithic tools at the Monte Verde site consisting of pebble flakes, projectile points, flaked debitage, and grinding stones (Dillehay et al. 2015). The grinding stones yielded remains of seeds, nuts, and pollen from economically useful plants that dated at approximately 14,500 bp. Though, in this study Dillehay and colleagues (2015) did not find macro-botanical remains, micro-botanical remains of pollen, starch grain, and phytolith, studies suggest a grassy wetland environment. Faunal remains of gomphothere and a small horse were also found at the site, but there were no cut marks, striations, or root scars (Dillehay et al. 2015).

Conclusion

Understanding the trophic relationships in an ecosystem can give better insight to the flora, faunal, and human existence of the Americas. Patterns of diffusion in genetic diversity support the patterns of the American routes along the Pacific Rim, and, by 12,000 bp, humans would have been present throughout the Continent (Mazières 2011). Eric Scott (2009) proposed the idea that changes in climate conditions and resulting

biological pressures are responsible for the mass extinction, because something different had occurred. The climate changed numerous times in the Late Pliocene and Pleistocene epochs and only resulted in small-scale extinctions (Scott 2009). Antique bison may have made it difficult for other megafauna to survive after the ET impact and the onset of the YD cooling. Maritime foragers along the Pacific Rim migrated along the coast as early as 16,000 bp (Hall et al. 2004). While the overkill hypothesis dominated in the past, researchers are understanding that the megafauna extinction are caused by much more than hunting by ancient Native Americans.

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