MUSIC AND PALEOLITHIC MAN:
THE SOUNDTRACK OF HUMAN COGNITIVE DEVELOPMENT

by

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A thesis submitted in partial fulfillment of the requirements
for the Honors in the Major Program in Anthropology
in the College of Sciences
and in The Burnett Honors College
at the University of Central Florida
Orlando, Florida

Spring Term 2012

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Abstract

Archaeologists have pored over countless texts of the ancient civilizations, attempting to piece together bygone worlds. However, relatively little work has been done to reconstruct the musical history of these societies, and even less on why their musical histories are important. This paper aims at a synthesis between the ancient Egyptian and classical Greek archaeological records to analyze the importance of music in Paleolithic human cognitive development.

Countless musical instruments have been discovered globally, ranging from pre-Columbian bone flutes in Oaxaca, Mexico to ancient trumpets in Egyptian burials (Barber et al 2009). Apart from their place in a museum, minimal work has been done to ascertain their importance to human society as a whole. This thesis attempts to display the crucial need for more research in this field.

The recent decline in support for arts education in favor of 'hard sciences' and mathematics is deeply disturbing; the history of humanity should be important not only to anthropologists and historians, but to members of all disciplines. This lack of interest in 'soft sciences' and the arts may lead to a complete loss of ancient musical history; a loss that would be devastating to history, anthropology and the worlds. The contents of this paper portray both the ancient importance of music, and how it contributed to increased cognitive faculties during hominid development.

Dedication

"Music is a universal language and truly the greatest of the arts."
Kappa Kappa Psi National Honorary Band Fraternity Creed
For my Big Brother, and the brotherhood of Eta Sigma,
AEA

For my mother and father – words cannot express my gratitude. For everything that you are, and all that you do, from the bottom of my heart I thank you.

For my thesis chair, Dr. Walker, you have been and will continue to be an inspiration to me. Your dedication and intelligence are unrivaled.

Mr. Peter Blum – Your generosity has made this work possible. A million times, thank you.

To Mr. Lee Brody – You instilled in me a love of music that I did not think was possible; I would not be who I am today without your influence.

Acknowledgement

This thesis would not have been possible without the help of the following people. Thank you to everyone at the Burnett Honors College for your advice and tenacity. A big thank you to the anthropology department, especially Ms. Lisa Haas, whose immediate email answering abilities are unrivaled. To the best thesis chair anyone could ask for, Dr. John Walker, thank you; there is not enough paper on this earth to describe how helpful and supportive you have been for the past two semesters. Dr. Sarah Barber, your willingness to work with me from Oaxaca is a testament to the love you have for archaeology and its advancement. To Dr. Scott Tobias, you aided me above and beyond the call of duty, and I cannot thank you enough. For my best friend and mother, you mean the world to me. This thesis would not have been possible without your love, support, and last minute proof-reading in the wee hours of the morning. Chris Angel, my loving father, your tenacity, intelligence, and love of all music have had a lasting impact on my life; thank you for everything. To my Big Brother, Cameron Yeager, I cannot express the gratitude I feel for the belief, trust, and faith you have in me, it means the world to me; for the Eta Sigma brothers of Kappa Kappa Psi, continue to strive for the highest, for you are greater than even your wildest dreams could suspect. Lastly, for my partner in crime, Chelsea Irish, thank you for keeping me on track and getting me through this semester with gas and food, and copious amounts of comedic relief; I could not have done this without you.

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Introduction - Prelude

Before beginning, it is important to understand the broad definitions of both archaeology and music, and their functions pertaining to this paper. Due to the vast time frame being analyzed, comprehension of terminology will make the shifts between time frames more manageable. In addition, the concept of cognition will be referenced throughout the work. Cognition is a crucial point, and establishing it early on will avoid confusion later.

Many definitions of archaeology and its functions exist in academia; nearly every anthropology textbook begins with some definition of the field. In this case, archaeology will be defined as "the study of earlier cultures and lifeways by anthropologists" (Jurmain 2008:6). In this paper, we shall consider multiple cultures and their response to music as exhibited through their lifeways. Ultimately, we hope to understand music's crucial role in human cognitive evolution. As stated by Jurmain (2008:7), "the main goal of archaeology is to answer specific questions about human behavior". The specific question we are concerned with is music's effect on human cognitive faculties. By examining evidence found in various cultures' archaeological record over time, we can create a picture of music's evolutionary effect on the human mind. With this in mind, we can explore a definition of music as it relates to archaeology.

For our purposes, Jeremy Montagu's (2007:2) definition of music is applicable; "music is sound that is generated deliberately *to create emotion"*. The inclusion of the words "generated deliberately" is crucial to this paper; creation of anything "deliberately" implies abstract thought. The presence of abstract thought displays a sense of self-awareness that correlates to increased cognitive faculties. It is this relationship of music to cognition that is crucial to both this paper and our understanding of increased human cognition, when increased human cognition has a

relationship with brain size. This relationship is enhanced by the phrase “create emotion”; emotion in this instance refers to how a musical event makes one feel. Now that a foundation of music and archaeology has been established, a brief explanation of cognition will complete the terminology introduction.

The last concept that requires addressing is cognition; “cognition describes the mental activities that manipulate, translate, and transform information represented in any modality” (Thomas 1998:48). Cognition is a key element of this paper, and will be delved into in some detail, both neurologically and culturally. Basic as it is, this definition explains that cognition manipulates and transforms information from any medium into a message with meaningful content. The words on this paper are a medium of communication, but they are meaningless without the cognitive capacity to manipulate the letters into words, and words into sounds, to translate the sounds into words, and understand that the words have meaning. This process of cognition requires active thought in several areas of the brain that develop over time. While soft tissue does not often survive the test of time, it is possible for archaeologists to track the increasing cranial capacity of hominids through the fossil record. The size of a hominid brain correlates significantly to the levels of cognitive functions that can be performed.

Research in this theory is in its infancy, and demands further attention from multiple disciplines in conjunction with archaeology. The recent decline in support for arts education in favor of ‘hard sciences’ and mathematics is deeply disturbing; the history of humanity should be important not only to anthropologists and historians, but to members of all disciplines. This lack of interest in ‘soft sciences’ and the arts may lead to a complete loss of ancient musical history; a loss that would be devastating to both history and anthropology. The contents of this paper

portray both the ancient importance of music, and how it contributed to increased cognitive faculties during hominid development. Just as verbal language is used to communicate varied emotions and ideas, music serves the same purpose. Its uses are as varied as its practitioners, ranging from religious expression to entertainment and hunting.

Chapter 1 - Sonata

In order to understand the communicative properties of music, an understanding of language and its functions must be known. As enumerated by Laura Ahearn, humans are the only species that possess definitive linguistic structures with alphabets, syntax and structure (Ahearn 2012:18). Language as a means of communication is strictly a human feature made up of four main components. These main components can be applied to both music and spoken language with ease and adaptability.

Components of Language

The first component of language is multifunctionality, which can be defined as "all the different kinds of work that language does" (Ahearn 2012:18). This definition is as broad as the range of languages the world over. In essence, it implies that language does more than "simply referring to or labeling items or events"; it conveys emotions, describes situations and set scenes (Ahearn 2012:20). Music is multifunctional in the same way that language is, in that it describes moods and sets scenes.

For example, film orchestrations let the audience know when the mood changes from happy to somber, safe to frightening. Nothing in the music explicitly states that the mood is changing, yet the audience understands. Unlike the language the characters in the film are speaking, the score does not need to be changed for viewers in China compared to the United States. A film score is comprehensible worldwide, whereas linguistic communication (such as English or Mandarin) is not, and must be altered. Essentially, music means something everywhere, but English to a Mandarin speaker sounds like nothing. While the interpretation of a musical score can vary depending on the listener, the distinct meaning of an English word must

be known to the listener in order for the word to carry any weight. In this way, music is a more universal communicative device than English, because everyone speaks music, not with their mouths but with their minds. The multifunctionality of music can be proven further by continuing the film orchestration analogy.

When viewing a film, the orchestration is aided by dialogue between characters and the images on screen. Removed from the film, the orchestration stands on its own as a comprehensible, emotive statement. A testament to this are the numerous soundtrack concerts put on worldwide by philharmonic orchestras. In a stand-alone situation, music is as comprehensible as the dialogue spoken by the characters, if not more-so because it lacks the need to be transliterated for different audiences.

The second component of language is language ideology, or "attitudes, opinions, beliefs or theories that we all have about language" (Ahearn 2012:20). A fine example of language ideologies are the different dialects of Spanish, and how they are received in Spain and other countries. Often, Spanish from Puerto Rico is considered a lower form than that of Spain; the form of Spanish from Spain is considered to have more linguistic merit than the form from Puerto Rico. This unwritten rule about the form of language one speaks is a language ideology, because its foundation lacks any form of fact.

In music, similar ideologies exist, in what I shall dub as 'music ideologies'. An example of music ideology can be the preference of classical music to dub step (a form of new-wave electronic music), because classical music has more perceived merit. There is no method to determine whether classical music has more merit than dub step because there is no way to test for this; the same is true of language ideologies, they have no basis in anything other than

opinion. However, the basis of opinion for which these ideologies are founded upon strongly correlate to peoples' personal feelings about their ethnicity, race, or nationality. This will be discussed further in greater detail in chapters three and four.

The third component of language is practice. As a concept in linguistic anthropology, practice contends that "structures at the same time constrain *and* give rise to human actions, which in turn create, recreate, or reconfigure those same structures" (Ahearn 2012:23). While somewhat paradoxical, practice is crucial to the development of language structures; language creates social constructs, while these constructs in turn create language. The structures of music are not dissimilar to structures in language, in that there are set terms created by composers to describe their music, which are then applied to other situations that can alter the terms' initial meaning. For example, the term *forte* in music refers to a note played powerfully, and often loudly. In colloquial usage, *forte* refers to a person's strong suit or talent. The colloquial *forte* takes its definition from the musical *forte*, thus providing an excellent example of practice in action.

The final component of language, indexicality, is a concept rather than a term to be defined. In essence, linguistic indexicality consists of a symbol which "refers to its object by virtue of convention" and an icon which "refers to its object by means of similarity" (Ahearn 2012:27). An example of indexicality can be the word *cat*, which refers to the typically furry, quadruped mammal that often vocalizes *meow*. There is nothing inherent about the word *cat* that implies this creature we have come to associate it with, other than society making the association. The word *dog* could just as easily represent a cat, yet it does not; this is because society has indexed the word *cat* to refer to a feline.

Many of the terms used in music can be deemed indexed. For example, a sonata is a type of musical piece whose definition has been altered throughout the ages of music and stylistic change. The varied definitions that the term *sonata* invokes depend on the era in which the specific sonata was written, whether classical, romantic or baroque. These four aspects of language (multifunctionality, language ideologies, practice, indexicality) can be applied seamlessly to music. By these components, music constitutes a language with the same communicative capabilities as English, Mandarin or Spanish.

Additional Aspects of Language

Languages consist of more than just the aforementioned components. All written languages require a visual mode that aids in the transfer of ideas, or rather, an alphabet. Writing systems vary all over the world, from English's Roman alphabet to ancient Sumerian "wedge-shaped" cuneiform (Olszewski 2007:349). The varied forms of alphabets bear a certain testament to the human ingenuity, creating specific characters for entire words, as is present in Mandarin Chinese.

Regardless of what the alphabet looks like, people who use it understand its intricacies. Musicians understand their alphabet of notes on a staff in much the same way that a reader of this paper understands the words on the page. It can be said that notes on a staff are the musician's alphabet, as words on paper are an author's. Anyone anywhere in the world may learn to read English in the same way that anyone may learn to read music. This only occurs because an alphabet corresponds to a certain language, the Roman alphabet for English and musical notes for music.

Accent notation can be used to further the comparison between a musical alphabet and a conventional alphabet. The Harvard Dictionary of Music defines an accent as “emphasis on one pitch or chord” which can result in a stylistic change over an entire phrase of music (2003:3). Conventional language uses accents in a similar capacity, such as in Spanish. Visible accent marks above a letter denote a change in pronunciation, often creating a different meaning entirely than the word without the accent. Accents in music function in much the same way, altering the way a note is played (or pronounced) in order to create a different style for the note. Accents are part of the way in which intent and feeling is communicated via language, representing the multifunctionality of language.

The Result – Music is a Language

Until this point, the discussion has focused on aspects of language and their corollaries in music to achieve the understanding that music can, in fact, be considered a language based upon previously accepted definitions and components of language from linguistic anthropology. The remainder of this work builds upon the understanding of music as a language, positing that music is a proto-tongue to all conventional languages that exist today. This theory is built on the back of archaeological and neurobiological evidence displaying music’s effect on cognition in the hominid mind.

Chapter Two – Ballad

Hominid fossils from the Paleolithic Era, while often fragmentary, provide the clearest insight to our ancestors' evolutionary track. The ever-increasing-in-size cranial fragments found scattered across Africa, Europe and Asia indicate advancement of the hominid creature as it battled for existence. The communicative sound system developed at some point during the Paleolithic Era spurred a heightened cognitive state, which the hominid brain would only add to in the million years ahead, culminating in the speech and musical patterns of todays' *Homo sapiens*.

Anthropologically, the conscious use of music to convey meaning implies both an intellectual awareness of self and of others. By deliberately generating sounds in the form of music, Paleolithic man began to acknowledge his own mental capabilities as well as those of his counterparts. Without a written or verbal language, the only viable means of communication left is sound. When sounds become emblematic of certain emotions or physical states, they become music. This musicality and meaning of sound becomes central to the communication and survival of Paleolithic man, opening up his cognitive faculties to the creation of verbal and eventually written language. The Paleolithic fossil record bears this out.

The Psychology of Speech and Cognition

Through modern PET (positron emission tomography) scans of human brain activity, humanity has learned a great deal about the neural connections of the brain, not least of which being the centers of the brain related to language and speech. Named for their two psychologist discoverers, Broca's area and Wernicke's area are the zones of the brain most closely associated with language and speech.

Broca's area is located in the left hemisphere of the brain, in the inferior posterior part of the frontal lobe. "Broca's area is involved in phonological generativity", or the creation of sentences with proper syntactical structures (Brown 2006:2799). Also located in the left hemisphere is Wernicke's area, responsible for the decoding of incoming linguistic information. A final piece of evidence testifying to music's classification as a language would be music's use of the same neural pathways as language, which is precisely what researchers attempted in 2006. "[T]asks for music and language were compared using positron emission tomography" (Brown 2006:2791).

This study involved researchers asking participants to respond to both linguistic and musical stimuli while the researchers took a PET scan of their brain. What they found was remarkable; "Direct comparisons of the two tasks revealed activations in nearly identical functional brain areas" (Brown 2006:2791). The activation of the same brain areas, which happened to include Broca's area, provides solid evidence that music is interpreted by the brain as a language. Recall that the Paleolithic Era began roughly 2.6 million years ago. An extraordinary evolutionary achievement also occurred close this time. "By examining endocasts, molds of the inside of fossil skulls, anatomists believe that these speech centers had appeared with early *Homo* around 2.5 million years ago" (Willoughby 2007:26). An endocast is a "fossilized cast of the interior of a skull" which can show details of about the brain and its size (Campbell 2006:165).

These factors together make a compelling argument to view music as quite possibly the earliest language to have existed. As exhibited through fossil evidence, it is unlikely that this early musical communication would have been complex. Fossil evidence from Kenya displays

clearly the motor functions necessary for complex human speech, and the speech that an early hominid would have been capable of.

Fossil Evidence – KNM - WT 15000

In 1984, the skeleton of KNM – WT 15000, commonly referred to as Nariokotome boy was discovered in Kenya. This twelve-year-old boy remains "the most complete early hominin skeleton ever" (Campbell 2006:276). Standing at five foot three inches and approximately 1.5 million years old, this *Homo erectus* has provided great insight into the anatomical structure of early hominids. In particular, Nariokotome boy provides information on the other anatomical structures necessary to create vocalizations.

"Details of his thoracic (rib cage) vertebrae suggest that *Homo erectus* may have lacked the fine muscular control over breathing that is required for speech" (Campbell 2006:277). Rather than presenting a problem to a theory of early language development, it fits quite well. It is improbable to assume that 1.5 million years ago, hominids would have created a complex, verbose language like those of today. The more likely scenario is one of "throat-produced sounds, few vowels and rapid changes of tone" (Campbell 2006:306). This is made possible by the intercostal muscles of the thoracic region, which "function to coordinate and control inspiration (breathing in) and expiration (breathing out)" (Shipman 1996:265). In further support of this theory Pat Shipman states that Nariokotome boy "had a clear Broca's area" (1996:266). As previously established, Broca's area controls the creation of phonology (or sounds) and sentences.

To say that Nariokotome boy could not speak by today's standards is accurate, but that he could not speak at all is ill-informed. Nariokotome boy had a Broca's area responsible for the

creation of speech patterns and enough control of his intercostal muscles to create some sounds worthy of communicative value. These sounds, though primitive, were the first steps toward organized language. Interestingly enough, from Nariokotome boy onward, cranial capacity steadily increases. Though the archaeological evidence is scant at best, skeletons like Nariokotome boy yield incalculable knowledge to archaeology, psychology, and humanity.

Chapter Three – Waltz

The Paleolithic Era spans from 2.6 million years ago to roughly 10,000 years before the present. During this span, the earth was home to hominids including *Australopithecus boisei, Australopithecus robustus, Homo habilis, H. ergaster, H. erectus, H. neandertalensis,* and most recently *H. sapiens* (Campbell 2006). For ease of both chronology and continuity, this paper deals with the individuals currently under the genus *Homo.* In order to understand the hominids under this genus, this paper references hunting tools, diet, cranial structures, grave goods, and types of burials in which these hominids were found. These varied artifacts and situations directly relate to the cognitive capacity of the individuals. Through the evolutionary process, those species who exercised their cognitive faculties to the fullest survived, while those who did not perished. Of particular interest is the concept of communication as it relates to hominid hunting, diet and burial styles.

Humans today communicate with each other through ever-varied means, from speech to sign language, written messages to music. What is certain is that at some point in the hominid evolutionary chain, communication became a necessary part of existence. Had this not occurred, communication in any form would not be a central motif in human society. Societies of today build on those of the past to enhance their chances of survival. When dealing with relatively current time frames, written documentation can be used to enumerate theories; in the Paleolithic Era, there are no such written records. In order to compensate for this, an alternative form of archaeological research must be employed.

Societies with extensively studied archaeological records, such as ancient Egypt and classical Greece, provide comparative content for archaeologists. Contemporary archaeological

work conducted in these and other societies can be used to link theoretical ideas of past lifeways to concrete examples of contemporaneous counterparts. While somewhat graphic in nature, Paul Pettitt's work provides an excellent example of this method. The focus is not the content of the example, but rather what the example sets precedence for – the use of contemporary archaeological research to determine the source of archaic creations or instances.

A brief section of *The Palaeolithic Origins of Human Burial* discusses defleshing in archaic *H. sapiens*. Due to the age of the skull specimen in question, there were no written records to describe what caused the "25 linear cut marks" on "17 different locations on the frontal part of the cranium" (Pettitt 2011:49). Pettitt cites the following explanation from T.D. White as explanation for the striations:

> White (1986:508) argues that the symmetry and direction of cut marks in the frontal region suggests intentional defleshing of the Bodo individual by a hominin using a stone tool, and was able to match these to the location and nature of cutting marks on crania of gorillas that had been defleshed with steel knives in the nineteenth century. (Pettitt 2011:49)

This method of using contemporary facts, such as the striation marks on nineteenth century gorilla skulls, in comparison with archaic features, such as striations on an ancient hominid skull, to reach a logical conclusion concerning the origins of an artifact, site, or situation, lends this method to this study. For this reason, evidence from ancient Egypt and classical Greece are employed to comprehend Paleolithic hominid music evolution and its influences on cognitive functions as they exist today.

Paleolithic Hunting and Communication

Paleolithic hominids utilized hunting and gathering as their two means of food acquisition. While both involved considerable tool use, the tools used during hunting (and

preceding hunting rituals) are of particular interest to the archaeology of music and cognition, because "[a]ll paleolithic musical instruments were closely related to hunting implements or were by-products of hunting' (Lawergren 1988:34). Musical instruments, created with similar forms and functions as their hunting counterparts, imply their importance to early hominids; a hominid's life largely consisted of hunting in order to survive. This is evident from the different Paleolithic tool styles such as Aurignacian and Chatelperronian (Campbell 2006:397).The tools hominids used changed over time to better suit their needs, thus showing how crucial hunting was to their lives. However, it is the advent of music, art and other cultural items related to abstract thought that reveal higher cognitive function and self-awareness.

The Bull-Roarer

A prime example of ancient hunting tool turned instrument is the bull-roarer. Found in various countries, the bull-roarer "consists of a thin, oblong, plate (of wood, stone, etc.) tied to a string" (Lawergren 1988:35). When swung through the air, the plate makes a "low muttering sound" (Montagu 2007:3) or a "buzzing sound" (Lawergren 1988:35) depending on the length of string and size of the plate. Throughout history, bull-roarers have taken on multiple functions, from hunting implements, to ritual devices and even becoming children's toys.

The bull-roarer was used in "Dionysian mysteries" (Montagu 2007:3) in ancient Greece, likely because of the voice-like sound it created. Dionysian mysteries were similar to Bacchanalian affairs during which people would dance and sing to bring on a trance-like state. The bull-roarer's ability to mimic a human voice may have been used to advance the trance-state and communicate with the gods. This same feature may have endeared it to initiation ceremonies in Australia, Africa, New Guinea and South America (Montagu 2007:3). It is intriguing to follow

the changes the bull-roarer has undergone throughout its history. “It was also used in Paleolithic times in Europe, for examples have been found in Magdalenean sites in the Dordogne of southern France, at Laugerie-Basse and elsewhere” (Montagu 2007:3).

The Paleolithic bull-roarer may have been intended as a “call signal among hunters, as a means of frightening prey, or as animal imitation” (Lawergren 1988:36). When the length of the string is altered, a different sound or pitch is produced. In fact, changing any aspect of the bull-roarer created a different sound or pitch, whether length of string, size of plate, or strength of swing used. These changes would have required thought not only to produce the desired change, but to suppose that the desired change would have any effect on the sound. It is the abstract quality of this thought, that understanding an act in the present can create an immediate result in the future, is precisely the higher cognitive faculty the music instills.

All of these theories are plausible judging from the societies that still utilize this technology after the Paleolithic Era and continue through modern times. Using a bull-roarer as a vocalization between hunters implies its use as a communicative device. If the bull-roarer was used as a communicative tool as well as a hunting tool, it stands to reason that the bull-roarer in musical form was used communicatively as well. Recall that Pettitt used contemporary research to understand an early hominid behavior; the Greek musical uses of the bull-roarer provide tangible evidence of the archaic bull-roarer’s use to early hominids.

The consistent use of the bull-roarer in some form throughout hominid history speaks to its usefulness and multifunctionality as a hunting tool and ritual device. However, the bull-roarer is not the only hunting tool that potentially doubled as a musical instrument during Paleolithic times.

Bow and Arrow – The Lyre's Hunting Predecessor

In addition to the bull-roarer Paleolithic hunters made use of bow and arrow technology. A staple of any arsenal through the Middle Ages, bow and arrow weaponry has changed relatively little over time. A bow consists most often of a length of string fit tautly between opposite ends of an arched piece of wood. When the string is drawn, the wood bends backward, and energy is released when the string is let free. An arrow is made of a thin, often wooden shaft with a pointed tip fashioned from stone or bone, attached to the wooden shaft with string.

Bow and arrow hunting has been used for millennia to capture fast moving wild game, and is still used today by some hunter-gatherer tribes such as the Yanomami (Peters-Golden 2012:272). While arrows function as projectiles as well as close range stabbing weapons, bows are communicative as well as deadly.

When plucked, the taut string on the bow creates a twang-like sound that can be used to alert other hunters to the presence of prey. This was a tried and true hunting technique maintained throughout hominid existence. Bows featured prominently in Greek literature, perhaps most memorably in the epic works of Homer's *The Iliad* and *The Odyssey*. "[w]hen the bow was arched into a half circle, he let fly, and the bow twanged, and the string sang as the arrow flew gladly on over the heads of the throng" (Homer 2008:64). From *The Odyssey*, "Then he took it in his right hand to prove the string, and it sang sweetly under his touch like the twittering of a swallow" (Homer 2008:695). While Homer was not a historian, the prevalence of comparisons between bows and arrows and music cannot be ignored. Their relative frequency in his writing makes it clear that music was a relatable element of Greek life.

It is clear from the quotes above that bow and arrow technology was important to the ancient Greek culture, suggesting that "the musical bow has, indeed, ancient roots" (Lawergren 1988:36). The sound the bow string makes when plucked during a hunting expedition in the Paleolithic likely evolved into the lyres of ancient Egypt, Greece and elsewhere. However Jeremy Montagu states "[a] frustration with the lyre is that we first encounter it as a highly developed instrument in early historical contexts" (2007:128).

Lyre's have been unearthed in such places as Sumerian royal burials in Ur. In ancient Sumerian society social stratification was evident in burials; an average Sumerian may be buried with few grave goods while an affluent Sumerian may have hundreds to thousands of grave goods and sacrificial victims.

> Beneath them was a layer of matting on which he encountered the bodies of 10 women, lying in two rows, each richly ornamented with gold, lapis lazuli, and carnelian jewelry. Nearby was a gold – and jewel – encrusted harp, across which were the bones of the gold-crowned harpist. (Olszewski 2007:335-336)

Burial goods were gifted to the dead for use in the afterlife that the Sumerians believed was similar to their corporeal life. In accordance with this belief, more affluent members of society were able to bring servants with them in the form of human sacrifices. What makes this royal burial significant is the presence of a court musician and his instrument. Indeed, "musicians belonged to the temple staff and formed a hierarchy" (Duchesne-Guillemin 1981:295). His presence implies the importance of music in life and the Sumerian desire to continue musical enjoyment in the afterlife. Physically, a harp is similar to a lyre in that both are string instruments featuring sound production through plucking of taut strings. However, as Montagu stated, we encounter the lyre and harp as complex instruments without intermediary evidence.

The archaeological record is unhappily absent of intermediary instrument links between the musical bow and the lyre, making a direct link improbable with existing evidence. However, cave paintings from the later Mesolithic period in Spain depicting “hunters running or dancing with their bows” provide a tangible link to Paleolithic use of musical bows for pre-hunting rituals (Lawergren 1988:36). The use of music in ritual activity permeates every culture worldwide and warrants in-depth analysis while considering music’s ancient roots and effect on the mind.

The Impact of Music on Cognition Resulting from Hunting

Thus far the discussion has focused on music’s effect on Paleolithic hunting methods. In sum, hunting was used to acquire calories for consumption, and music was utilized to hunt efficaciously. The result of successful hunting was far more than a meal at night. “Big brains are metabolically expensive organs” (Campbell 2006:257). Metabolically expensive organs require higher calorie counts to maintain; this made hunting for Paleolithic hominids (early *Homo* especially) a crucial activity. A higher calorie diet “could nourish a larger brain” than had existed in hominid history before the Paleolithic Era (Campbell 2006:257). While hunting was not the only way to achieve a high calorie diet, it is the most expedient and effective one. This increased brain size resulting from more efficient hunting strategies owes itself to the innovating musical techniques of early hunter-musicians.

At this juncture it is necessary to point out that any language or musical communication at this time in hominid evolution would have been extremely primitive. As previously explained, the neurobiological pathways were not developed enough for complex musical communication. s The development of musical communication, and from it linguistic and written communication, was a slow process that occurred over millions of years with the neurological structures altering

along the way. It is not this paper's contention that music developed into a sophisticated communicative system at this point in hominid history; rather, it was advanced enough to spur on the generation of linguistic centers in the brain.

Chapter Four – Scherzo

Perhaps no civilizations on earth have been as thoroughly studied as ancient Egypt and classical Greece; the monumental architecture, tombs, wall paintings, temples, sculptures, mummies and artifacts come to life in museums around the world. Ancient Egyptians and classical Greeks both utilized music in their temple and home rituals, in addition to everyday life. Comparisons can be made by observing contemporary archaeological work and applying it to creations and situations in the past and drawing conclusions from the synthesis. The inclusion of these archaeological records in this study of Paleolithic music is twofold.

First, a greater understanding of ancient peoples and their ancestors furthers our knowledge of ourselves. Secondly, understanding our Paleolithic ancestors' cognitive functions allows us to chart a knowable subject (music) through human history in order to understand its effects on our minds. For example, had Paleolithic man used music as a protolanguage to convey ideas, then it stands to reason that he had the cognitive ability to think abstractly in order to communicate via a knowable channel. This knowable channel enhanced his understanding of the creatures and world around him, priming him for evolutionary success. It is the premise of this paper that the 'knowable channel' that initiated increasing cognitive functions in Paleolithic man was music. Through the alternative lens of music archaeology, a "generation of new hypotheses that will direct future research" shall emerge, changing the way we look at Paleolithic man, music, and ourselves (Barber et al 2009:106).

In addition, both Egypt and Greece are located near the cradle of humanity in Africa. Their proximity to this area, coupled with their extensively researched record, makes them the perfect case studies to exemplify music use in early civilizations.

Classical Greek Musical Record

Every vocal aspect of an instrument is utilized to create emotions in the listener. Music's ability to carry ideas, desires and intentions is crucial to the theory of Paleolithic music use as a communicative vehicle. Montagu uses instrumental bells as an example of musical intent. He states:

> Bells convey other messages, too: that it's time to come to church; or, with a slower tolling, that someone has died; or that this is an occasion for festivity and rejoicing, either general and national, or locally a wedding; or just that some bell-ringers are having fun; or for a school full of children and teachers, that work is over for today. (Montagu 2007:180).

The above quotation shows specific examples of music having a communicative function, either a call to prayer or to mourn. The same instrument (in this case, bells) can have a drastically different meaning depending on its timbre and tempo (speed). While this is a decent introduction to the use of bells, their importance demands further discussion.

"Bells are found across all regions of ancient Greece" and in a "variety of contexts: sanctuaries, graves and homes" (Villing 2002:246). The locations of these finds express the deeply-rooted meaning of music to the classical and ancient Greek people. In Sparta, bells were made from bronze and terracotta, which were "locally produced, given their sheer number" compared to other areas in Greece (Villing 2002:243). Many of these bells were "dedicated to Athena", the goddess of wisdom, who was said to occupy the main shrine on the Spartan acropolis. However, a further point must be made concerning the dedication of bells to Spartan Athena.

During the Paleolithic Era, it is likely that males were responsible for hunting. While this is still hotly debated among academics, it is not the contention of this paper to take a stance on

the debate. Research into the question of man the hunter is ongoing, and this paper is based on currently accepted teachings.

"Many of Athena's votives belong to the realm of (male) military victory" such as "success in athletic and equestrian contests" (Villing 2004:275). Positing that musical instruments had their roots in hunting would explain why a bell would be placed as a votive to a goddess in thanksgiving for a successful athletic or competitive event. In addition, these and other items used as votives were considered communicative vessels to the gods; a prayer would be inscribed on them and left in the shrine of a deity. That these musical instruments doubled as communicative vessels in the Paleolithic and classical Greek era speaks to both their multifunctionality and lasting impact on the human mind.

Gifts to the gods was a common theme throughout classical Greek and ancient Egyptian times, and is well reflected by the archaeological record. Gifts with "votive inscriptions" would often be placed in shrines or temples dedicated to specific deities that the people wished to venerate. In the Greek culture the god Hermes was depicted with an instrument already discussed, the lyre. As the "messenger god", Hermes carried information from the gods to the people of Greece (Evslin 1966:46). While he is also depicted with "winged sandals", it is interesting that the god of messengers should also have an instrument with him. Simply put, the Greek god of messengers also possessed an instrument that is communicative by its very nature. Not only is a lyre communicative, it is one of the few instruments that can contend to have archaic roots in the Paleolithic.

Bells in classical Greece were also found in funerary contexts. Perhaps the "earliest actual examples of terracotta bells within the Mediterranean area" were from Cyprus, indicating

a trade connection with the Near East (Villing 2004:250). Similar to the instrumental finds at the ancient city of Ur, it is possible that ancient Greeks had the same mindset of bringing music with them in the afterlife. The bells were "deposited in graves (later also in sanctuaries) on Cyprus from the later eighth century onwards" (Villing 2005:251).

Though the concept of *afterlife* has changed throughout history, each civilization seemed to place a certain level of importance on preparation for life after death, often including music in these preparations. Ancient Egypt is likely the most well researched civilization in terms of its afterlife preparations, from tombs, scrolls, burial goods, and the mummies themselves. However, focus will be trained on burial goods, specifically musical instruments as they correlate to communicative intent in Egyptian religion.

Ancient Egyptian Musical Record

"Songs were intended to honor the gods, entertain the living, and comfort mourners" (David 1998:373). Much like classical Greece, the ancient Egyptians used music to express themselves to their gods, particularly in funerary processions. Again, as in Ur, musicians were held in high esteem, often being "employed to entertain nobles in their homes" (David 1998:372). While the ancient Egyptians had a wide variety of musical instruments at their disposal, a particularly influential one that still survives today is the flute. A brief description of a flute and its sound-making apparatus should precede further discussion.

In an ancient flute, the lowest end of the instrument flared outward, similar to a bell. Over time, this *bell* became less flared, and the instrument changed from a vertical playing position to a horizontal one. This horizontal flute which people today are accustomed to seeing, has no bell, and is known as a *transverse flute.* The main section of both vertical flutes (known as recorders)

and transverse flutes is known as the *body*. The body of a transverse flute does not change shape at all from one end to the other, making the term for the end of a transverse flute *end joint* not *bell*.

The flutes recovered from ancient Egypt most closely resemble recorders rather than transverse flutes, which first "appears in the Ptolemaic period" (Duchesne-Guillemin 1981:291). The Nile River valley provided reeds out of which various instruments were made, including flutes and lyres. Reeds would have created beautifully delicate instruments making it "quite rare for such fragile and well-used musical instruments to survive" as was the case of a reed flute from 1450 BC (David 1998:373). Despite the survival of this and other musical instruments of the time, there is very little knowledge as to "how Egyptian music was played or sounded" (David 1998:373). However, ancient Egypt is not the only society in which the sound of music is temporarily lost.

A trading partner with Egypt, Mesopotamia (or Babylonian culture) also possessed musical affinities. Babylonian musical culture can be seen as a derivative of the Sumerian musical culture that preceded it, of which the importance of music has already been established. In 1969 a series of "cuneiform tables" were discovered inscribed with music notation (Duchesne-Guilleminn 1981:296). Cuneiform was the writing system of Mesopotamia which developed around the same time as hieroglyphics in Egypt. Unfortunately, the few attempts made at "reading this musical score" have proven unsuccessful (Duchesne-Guillemin 1981:296). In a similar way that Egyptian hieroglyphs were deciphered by Jean-Francois Champollion, the music of Babylon and Egypt may one day be heard again.

It is clear from the archaeological record the important role that music played for ancient Egyptians. The number of tombs that contain musical instruments as grave goods is a testament to the importance placed upon the joys of music. For a society preoccupied with death and the afterlife, it comes as no surprise that flutes and harps would be among funerary goods such as bread and wine. Music was even present at the funeral itself: “At the burial ceremony, when the guests shared a meal at the tomb with the deceased, a harpist recited special songs” in order to remind the patrons both of the joys of life and eternal existence in the hereafter (David 1998:372-373).

A Note on Time

The above descriptions of ancient Egyptian, classical Greek, Sumerian, and Babylonian music all serve as comparative tools to bridge the gap between the Paleolithic and today. This is necessary due to the non-existent written archaeological record of the Paleolithic, in a similar way that Pettitt used contemporary archaeological techniques to understand the defleshing of an early hominid skull. However, hominid fossils from the Paleolithic are available, and it is to them that the discussion now shifts. While written record speaks to both intent and use of instruments, only fossil evidence can exemplify the increased cognitive functions that music provided hominids.

Conclusion – Elegy

Evidence from the Paleolithic Era's archaeological record, the civilizations of ancient Egypt and classical Greece, accompanied by their predecessors Babylon and Sumeria, and modern day analysis of both contemporary and ancient brain structure through PET scan synthesis of speech centers in the brain, create a compelling case for music being the first communicative language. The fossils that show capacity for early forms of communication, such as Nariokotome boy, signal an increase in cranial capacities that ultimately result in *Homo sapiens*.

While difficult to find, evidence of music permeates the archaeological record in ways yet to be fully understood. Its presence around the globe denotes its innateness to human nature. Music's multifunctionality allows it to be used for recreation, worship, mourning, and communication. Its utilization of speech centers in the brain makes music a likely candidate for a universal language. Should music be considered a language, it may open new doors in speech therapy and psychology. If, indeed, music caused hominid brain size to increase, as the archaeological record suggests, it stands to reason that music was the first language. At this time, the subject requires further research from both archaeologists and musicologists.

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