

**SENSATIONALIZING THE ARCHAEOLOGICAL RECORD: HOW MODERN
CULTURAL PERSPECTIVES AND PROFESSIONAL COMPETITION
INFLUENCE EVALUATIONS OF MATERIAL CULTURE**

by

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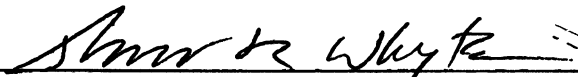
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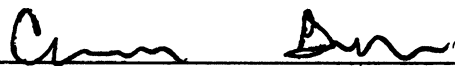
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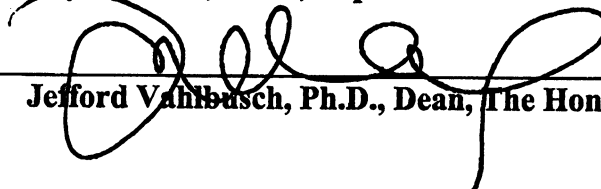
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Abstract

Archaeology is the study of the human past, using evidence of material culture left behind. This thesis examines how archaeologists interpret their evidence with reference to ethnographic and experimental analogy and their own experiences, and how those interpretations may be biased, failing to consider alternative hypotheses. Being human, archaeologists are incapable of complete objectivity. Furthermore, lacking time travel, they must rely on comparisons between the products of human activities observed in the present with those resulting from human activities undertaken in the past. Frequently, when making these comparisons, archaeologists subconsciously or consciously “choose” to argue for or assume one explanation of the evidence while ignoring others. This choice is often influenced by the desire to advance one’s career or academic status, or by adhering the current vogue theoretical perspective of the discipline. In this thesis, several case studies involving evaluation of color, material compositions and histories, contexts, and misidentifications are presented to illustrate potentially biased interpretation of archaeological evidence.

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Introduction

In archaeology, interpretations must be made with as little bias as possible, and conclusions must not dismiss contradictory interpretations without explanation. Archaeology is the study of human pasts by means of material culture and the contexts in which those materials are found. These contexts and materials can be interpreted in various ways by different people depending on many factors such as the amount of evidence available, time period in which the interpretation was made, language barriers preventing access to sources, and cultural beliefs. These interpretations are then used to make comparisons with other sites, form history, craft dialogue, and determine possible locations of other sites. The methods that archaeologists use to interpret a site are often affected by modern perspectives, thus influencing interpretations.

Archaeologists may have an understanding of how bias influences interpretations but may not be aware of how often, or to what extent, their own unconscious biases influence their interpretations. It is necessary to publicly state that bias does occur to remind and educate archaeologists, anthropologists, and the general public so that they may be aware that archaeological interpretations are never absolute. The public needs to be informed that, like many other scientific fields, archaeology does not have definite answers; and therefore, the readers need to be critical thinkers. Archaeologists need to explicitly state that their hypothesis is only one of many in order to remind themselves that they do make mistakes and will not always have a conclusive answer; it is alright to admit that the evidence might be inconclusive. By understanding potential ways biases occur, how cultural perspectives affect

interpretations, and examining their own personal motivations, archaeologists and anthropologists can work towards preventing this problem.

Personal motivations have influenced archaeologists to purposefully fake their findings and perform fraudulent acts to become famous. Donna Yates (2004) discusses several cases of fraud backing her discussions with multiple sources for each case. Yates notes that “the Hand of God” Shinichi Fujimura was caught placing artifacts and eventually, after enough evidence was found, confessed to planting many of his other finds. Yates also discusses the engravings found on pottery shards found at Iruña-Veleia, Spain that were declared fraudulent after 26 experts examined them for one year. According to the archaeologists they excavated authentic shards, thus the engravings must have been added later in the labs, likely by the leader of the excavation, Eliseo Gil, who continued to insist the artifacts were authentic (Yates 2014). These cases set a precedent for archaeologists purposefully falsifying their findings, meaning that it is entirely plausible that individuals might subconsciously inflate the importance of their findings.

How Assignments of Meaning and Value are Influenced by Archaeological Theory and History

Material culture includes the artifacts that were created and used by humans. Today, material culture has become synonymous with social, ritual, and personal values. Many individuals deem any material culture to have some form of value. Therefore, when individuals evaluate historical and archaeological information, they seek to understand the purpose and importance of objects (Ferguson 1988). This is further explained in discussions by Ian

Hodder (2014), longtime anthropological theory writer, through the concept of entanglement. He explains how humans depend on objects to live and perform activities, while simultaneously these objects also depend on humans to create them, to use them, and to put them into different locations. Once an object breaks, is replaced, or another tool or object becomes more popular, the cycle begins again. The most important aspect of entanglement is the dependency that objects have on humans, as it determines the contexts of archeological evidence. It is this connection between context and human actions that archaeology tries to understand. By working backwards from contexts, archaeologists try to explain what humans did to the objects that resulted in their deposition (Hodder 2014).

The theory and methods of interpretation used in Processual Archaeology appear to be comparable to the modern production of materials and objects through factory processes. Due to this similarity, Processual Archaeology is used by archaeologists to understand the way a society worked, on the basis of changes in archaeological contexts. When using processual methods, archaeologists compare evidence of outside stimuli interacting with a site and the behavioral changes that occurred in the same time period. This is done because of the belief that an individual's behaviors and creations reflect the interactions of different societies. Therefore, how people react to stimuli, observed through evidence of behavioral changes at the time of the stimuli, allow archaeologists to understand the rules and goals of the society in which the studied individual existed. Through Processual Archaeology, archaeologists interpret artifacts as a reflection of society, not considering the individual that created the artifact (Hodder 1985).

Additionally, the way individuals view objects as having historical value is based on their irreplicable nature. Artifacts that have withstood time are held in reverence by modern

societies, having survived since they were created, and being gateways for contemporary individuals to learn about the past. This idea is elaborated on in Matthes' (2013) discussions about how individuals can form emotional resonance to objects if they feel a connection, meaning that it is possible for individuals to attach personally with significant objects. These connections are based in general emotions, such as respect, wonder, awe, disgust, or hatred depending on what ideas and experiences the object evokes in a person's mind. As a result, objects found at historical and archaeological sites are not only valued due to their irreplicable history and placement, but also because the objects evoke an emotional response (Matthes 2013).

Kelly and Thomas (2016) discuss the nature of science to correct misunderstandings about science and describe the scientific method in archaeology. They state that science is objective and concerned with the viewable, measurable world. Questions are scientific if they are concerned with the detectable aspects of item, and if the "result of observations designed to answer a question cannot be predetermined by the biases of the observer" (Kelly and Thomas 2016:23). Science is systematic, attempting to collect data to find a solution while being explicit about actions and procedures, so any other trained individual could make the same observations in the same conditions. This is difficult for archaeologists as the nature of contexts and interpretations made are largely symbolic. Science is logical, working with "data (low-level theory), the ideas that connect data with interpretations (middle-level theory), and with the ideas that link different ideas together (high-level theory)" (Kelly and Thomas 2016:27). Kelly and Thomas also note that science is explanatory, attempting not only to predict what will happen in specific conditions, but also to explain why. This is done by making a hypothesis and then attempting to prove that hypothesis wrong. In the process

scientists acquire understanding by showing that competing hypothesis do not adequately explain the evidence. Additionally, science is made public so that the people can scrutinize the methods and results (Kelly and Thomas 2016).

All of this can be reduced to an idealized six steps listed by Kelly and Thomas:

1. Define a relevant problem.
2. Establish one or more hypotheses.
3. Determine the empirical implications of the hypotheses.
4. Collect appropriate data through observation and/or experimentation.
5. Test the hypothesis by comparing these data with the expected implications.
6. Reject, revise, and/or retest hypotheses as necessary (Kelly and Thomas 2016:27).

They note that scientific research does not always progress neatly through each of these steps. This is especially true in archaeology as much of the interpretations about a site's context and the meanings behind the designs or creation of phenomena are speculative due to information being lost due to death and time. However, archaeologists must seek to adhere to this method as best as possible.

Furthermore, they note that science is not infallible and has "false starts, dead ends, preconceived notions, and cultural biases" (Kelly and Thomas 2016:28). Science is intertwined with the cultural biases of scientists: the social, cultural, and political contexts influence archaeological theories. However, they note that "scientific approaches do not

always deliver the right answer on the first try, or even the second or third. Sometimes the truth is only evident in hindsight” (Kelly and Thomas 2016:28).

Furthermore, Avnur and Scott-Kakures (2015) discuss the idea that bias influences beliefs and note that there is difficulty in identifying those biases directly. They state that it is impossible to absolutely demonstrate that bias influenced a conclusion. However, they do recognize that it is possible to show that there are faults to an interpretation or that there are alternative interpretations of similar events. Therefore, bias can be recognized, as it is simply the act of favoring or believing in one idea over another and is not, as many believe, simply the result of prejudice. To expose bias is not to expose prejudice, rather it is to reveal that there are other possible explanations when the evidence is reassessed (Avnur and Scott-Kakures 2015).

How Ethnographic and Contemporary Observations Might Contradict

Archaeologists must make reference to contemporary observations when interpreting evidence from the past. This may be done through ethnographic analogy, experimental archaeology, or observing phenomena in daily life to evaluate their hypotheses. These methods can contradict archaeological interpretations and expose or even impose bias in many ways. Using modern ethnographic observations of people today, it can be recognized that attributes considered significant by archaeologists are often those that are deemed valuable in the present, but that do not necessarily reflect how attributes were valued in the past. Examining how objects are valued, based on modern concepts of value, can aid in understanding why archaeologists have deemed specific items “important.” This concept of

placing modern-day value on relics, with reference to ethnography-based misinterpretations of value, can be faulty. Archaeologists hold authority over past cultures and the artifacts of those cultures. When research is published and findings are disclosed, the public and those within the field must be made aware of other possible interpretations so they do not take the interpretations as absolutes.

In this thesis I examine archaeological biases in assigning meaning to (and therefore *evaluating*) archaeological evidence based on the attributes of artifact and soil color, material composition, material history/provenance, and spatial context. In archaeology, items with unusual colors are often interpreted as “important” for various reasons. The most common reason that a color is deemed important is that it is unusual, brought out through material processing, or perceived as symbolic. In many modern societies, specific colors are often associated with meaning. Although there is evidence that a color was meaningful to past societies, it is not always evident what that meaning might have been, or that the creators had specific colors in mind when creating their works. Frequently in archaeology, these “beliefs” about colors appear to be based on assumptions or so-called (but unsubstantiated) common knowledge.

Material composition is an attribute used by archaeologists to determine where an object originated. Often, knowledge of its origin is used to evaluate the significance an object held in a society. An extension of this is the material history or provenance of an object: the geographic origin of the substance of which an object was made, the distance between its origin and deposition, how it was transported, the crafting of the material, and the purpose for the material’s use. These traits, as well, are often used by archaeologists to assign value. Archaeologists often use ethnographic observations of material records to support their

conclusions, while sometimes ignoring or leaving out alternative interpretations that might be informed by other ethnographic analogies. Additionally, there are cases where assumptions are made about the history and origins of artifacts based on the contexts and “known” facts with no actual supportive evidence provided.

One of the most important factors in archaeological interpretations is archaeological context—the physical placement of an object in space and its spatial relationship with other objects. Archaeologists document context by noting where artifacts and features appear within a site. It is also something that is permanently lost through excavation, requiring archaeologists to carefully record context as accurately as possible. Occasionally archaeologists focus on only certain contextual information to support their interpretations. Archaeologists must use the entire collection of evidence, not just certain parts of the context, to make a sound interpretation of their findings.

Archaeological Interpretations Based on Color

Biltmore Mound, Western North Carolina

Biltmore Mound, located along the Swannanoa River in Asheville, North Carolina, was built over a Connestee phase habitation. The earliest evidence at the site dates to approximately A.D. 300, with construction of the mound starting approximately A.D. 400 to 550. The mound was a platform constructed of distinctively colored and textured soils from multiple sources and supported a large structure. Both the mound and structure were evidently used for ritual and ceremonial purposes, and arguably had symbolic importance. The mound was

created outwards with several mantles possibly forming a complete ritual cycle of mound construction (Kimball et al. 2010).

Kimball and colleagues (2010) observed that the structure on the mound consisted of upright posts that had been pulled and then filled with yellow sand. The fact that this sand was yellow and transported some distance to the mound indicated to researchers that the sand and its color were symbolic. Additionally, the underlying mound was composed of many colors and textures of soil, and contained ritual paraphernalia. In support of their interpretation, Kimball and colleagues (2010:47) note that: "Sand-filled postholes forming a structure centered beneath the earliest mound were also noted at Garden Creek...This filling of postholes with yellow sand obtained from elsewhere may have been ritually prescribed."

Initially, the interpretation that the choice of yellow sand to fill postholes at Biltmore was ritualistic appears to be logical. However, there is no real *evidence* that the filling of postholes at the site was ritualistic. Researchers likely thought that the sands had ritual meaning only because of the association of the postholes with seemingly ritual artifacts, and the widespread evidence of color symbolism among contemporary societies and at other mound sites in the Southeast (DeBoer 2005; Rodning 2010). Yet the yellow sand used to fill the postholes is not similar to the sediments used to build the mound, and the ritual paraphernalia does not intersect with locations of the postholes. Whyte and Wright (2021) propose an alternative hypothesis, that yellow sand just happened to be what was expediently available, and that its color would allow site occupants to relocate and easily re-excavate postholes for later rebuilding of the structure on the mound (Whyte and Wright 2021). Kimball and colleagues were likely influenced by their reading of similar interpretations at other Hopewellian sites in the Southeast. Additionally, it is likely that this conclusion was

reached due to the popularity (at the time of their writing) of searching for evidence of ritual in the archaeological record.

Irish Axeheads

The Irish Stone Axe Project has recorded over 20,000 stone axeheads, most of which come from the Neolithic period, though they were first crafted in the Mesolithic and continued to be crafted into the Bronze Age (Cooney 2002). These axeheads represent many lithological sources and it is “widely recognized that stone axeheads had a range of functional and symbolic values” (Cooney 2002:94-95). Axeheads of Ireland are found in many different colors due to their lithologies and treatment during crafting. Cooney (2002:93) investigates the meanings behind the colors of the axeheads as “There is a long tradition in Ireland of symbolic meanings being attributed to different colors.”

Cooney (2002) uses the project’s documentation to discuss his hypothesis that in Ireland’s past, color was carefully used and featured in items to imbue them with meaning. He supports his recognition of color symbolism by referring to the oral and written histories of Irish traditions, and how colors are attributed to having specific meanings.

Using this cultural knowledge, Cooney notes how certain color traits are highlighted through polishing and grinding of axes. He also argues certain axeheads appear to have been made to bring out the brightness in lighter colors, especially in axeheads made of quartz. He further discusses the use of red and brown sandstone as grinding stones for white quartz and for increasing the whiteness of the porphyry. Cooney reasons that this was to vitalize ancestral powers of the rock, due to association of the colors red and brown with vividness and blood. Cooney also speculates that the selection of certain stones, such as porphyry, from

shoreline sites would have been dictated by the striking contrasts of color in dry and wet stages, as this would show how the stones would be affected by the axe making process. Supported by oral and written histories, Cooney concludes that everything about the making of these axeheads is focused on the color involved (Cooney 2002).

Cooney's inferences regarding these stone axeheads are made based upon interpretations of text and oral histories, it is possible that there were errors made in the translation of text and telling of stories. One of the most well-known modern examples of mistranslations resulting in bias is the Judeo-Christian Bible (Scroggs 1983). Scroggs discusses that bias against homosexuality in Christianity is the result of individuals misinterpreting and mistranslating the text. There are no actual mentions of homosexuality in the original texts only "possible" references. These references are also often taken out of context, usually ignoring that the passages are condemning a person for different behavior such as "prostitution" or "infidelity" rather than the homosexual actions (Scroggs 1983). This displays the fallible nature of text and oral histories, of which the Bible is both. Similarly, Cooney uses selected quotes chosen to prove his point, but without discussing the relevant contexts used in the translations. Therefore, when Cooney uses Irish histories to give value to the axeheads based on their color, he is basing his assumptions on his biased belief that the translations are correct and have not been reinterpreted. Cooney uses no physical or other corroborative evidence to argue that his hypothesis best explains the observable phenomenon or provide multiple consistent accounts of the histories to bolster or challenge his interpretations.

Color and Cardinal Directions in the Americas

Many societies equate colors with cardinal directions (Closs 1988). This is based on the idea that the colors associated with each direction would come from the primary color that could be seen when looking in that specific direction (such as a red sunrise in the east). This knowledge has been used to interpret why colors were placed in certain locations, the reason for the layout of a site, the purpose of events held in certain areas of a site, and the colors used for buildings or other features. This idea of quaternary-color systems and cardinal points is often used in archaeological interpretation (e.g., Closs 1988 and Rodning 2010).

Closs (1988:402) responds to Coggins and Bricker who claim that his hypothesis about color symbolism, seen in the Mayan cardinal directions, is incorrect, as the “traditional north-south axis in Maya directional symbolism pertains more properly to a zenith-nadir axis.” In other words, the north-south axis would represent an individual’s overhead [zenith] to underfoot [nadir]. Closs seeks to refute this claim by observing the color symbolism and structure of several Classic Maya communities. He discusses the fact that Mayan people used cardinal points to denote directions and how certain colors were associated with the cardinal directions. Closs claims that the color association of red with east and black with west is due to these colors representing the sunrise and sunset respectively. He provides further evidence based on miscellaneous translated excerpts of works he fails to cite, along with the knowledge that the words that represent cardinal directions in these excerpts also translate to mean these colors (Closs 1988).

Similarly, Christopher Rodning (2010) examines color symbolism in construction of Cherokee townhouses at the Coweeta Creek site (31MA34) in Macon County, North Carolina. These townhouses were built on a mound made of different colors of sand.

Townhouses and plazas such as those seen at Coweeta Creek were venues for dances, deliberations by town councils, ritual preparations for warfare, and events related to trade and diplomacy (Rodning 2010). At the Coweeta Creek site, Rodning observed a minimum of six successive stages of townhouses spanning the time period from the 1600s through the very early 1700s. In looking at the placement and areas of the town, and many townhouses built and rebuilt on the same spot, Rodning notes how colors are 'balanced' out. He interprets the town layouts using inferences that cardinal points influenced the colors used for quaternary-color directions. Rodning's interpretation involved using quaternary-color directions, in conjunction with cardinal points, to explain the purpose and placement of the mound's southeastern ramp based upon the soil color. In this interpretation, the ramp would have been used by individuals or groups that were entering the area with peaceful intentions. This is because the soil that makes up the ramp is white, a color, Rodning states, well known to be associated with peace. This ramp points to the southeast because white is associated with the south. He also proposes that this white ramp would have needed to balance out a red ramp, which would have represented violence. This red ramp would have been pointed east as red is the color associated with sunrise (Rodning 2010).

Warren DeBoer (2005) challenges the validity of R. B. Dixon's (1899) conclusion that there is no common set of colors among societies for quaternary-color directions and cardinal points. Instead, Dixon suggests that the colors of a quaternary-color direction would be dependent upon an area's geography, a societies orientation, and specific colors associated with the different directions of that area (Dixon 1899).

DeBoer investigates the reasoning for the meanings of certain colors in discussions of quaternary-color systems, presenting data from ethnographic reports, and evaluating how the

data compares to archaeological records. DeBoer uses examples of color assignment to different concepts and items in cultures to statistically interpret whether there are enough records that are supported by ethnographic interpretation or consistent archaeological evidence. He does not specifically work to prove or disprove the existence of a group of common colors used for cardinal points, but rather seeks to gather data to generate a conclusion. DeBoer provides tables documenting what colors are associated with directions in ethnographic groups and finds that there is evidence that the colors associated with specific directions vary, depending on the geographic locations. This indicates that the system used by Rodning (2010) and Closs (1988) is likely inappropriate, as it was based on a common set of interpretations that the colors would be uniform amongst all groups within a region. The ethnographic groups vary in their associated colors; therefore, it is highly likely that if color symbolism did occur it would vary between sites and not be uniform. However, DeBoer also points out that there are numerous inconsistencies among Dixon's established directional colors based on the geography of sites. For example, Dixon suggested that in areas of higher latitudes, either black or white should appear to connect to the northern direction; however, DeBoer notes that for this to be accurate one must ignore several geographical features and assume that past individuals did the same (DeBoer 2005). DeBoer finds that there is little evidence of matching quaternary color systems, and in cases where archaeologists attempt to prove its use, the evidence is not convincing and relies more on assumptions.

DeBoer concludes that there is not enough solid evidence to conclusively support color symbolism. Furthermore, he states that if it were not known that colors in the past were associated with certain concepts, then the idea of a common color set applying to quaternary-

systems and cardinal points would not exist (DeBoer 2005). Archaeologists need to be careful in using color symbolism or assuming that a site's inhabitants considered colors important. While direct historical analogies from a site could be accurate, archaeologists must not assume that all sites in a certain region can be interpreted using the quaternary system of color symbolism. In sum, archaeologists are unwarranted in assigning the specifics of color symbolism to a particular site on the basis that it has been observed for societies at other times and places. Such interpretations must be presented as hypothetical and consider the possibility that further archaeological investigations will bring to light other possible interpretations.

Archaeological Interpretations Bases on Misidentification

Bison in North Carolina

It is widely believed by historians and the public that bison were present in western North Carolina throughout the past, and that they created the substantial trails observed along the rivers and streams and through gaps in the mountains (Ward 1990). Alleged evidence to support this was discovered in the 1960s, when remains of bison were reported from the 15th-century Garden Creek Mound No. 1 in Haywood County, North Carolina. These claims were backed up by identifications made by B. Miles Gilbert at the University of Kansas in 1967. Gilbert had noted that some of the remains were possibly elk, though he was adamant that the rest were remains of bison.

Ward (1990), skeptical of the presence of bison in North Carolina in pre- and post-Contact times, reexamined the bones identified by Gilbert, and concurred that some of them

were too large to have come from elk. This prompted him to declare the bones to be those of bison, the first of their kind to be identified in North Carolina (Ward 1990).

Ward cites the numerous statements and accounts that claimed bison already existed in North Carolina when Europeans arrived. When he saw the bones, they matched with what he *imagined* bison bones to look like (Ward 1990). Ward's biased belief of what an item should look like, influenced by the previous identifications and a poor comparative collection, led to his incorrect interpretation.

Whyte (2017) reexamined the bones of the Garden Creek mounds, and upon further review of the skeletal remains disagrees with both with Gilbert's identifications and Ward's confirmations. Instead, he concludes that the identifications were incorrect due to a poor comparative collection, and the remains are unquestionably the bones of elk (Whyte 2017). Although this *misinterpretation* of archaeological evidence was based on *misidentification*, it is possible that a more exhaustive attempt at proper identification was bypassed with the covert intent of elevating the significance of the find.

Fish Bones, Roanoke River, North Carolina and Virginia

In 2001, Amber VanDerwarker, a graduate student at the University of North Carolina at Chapel Hill studied archaeofaunal specimens from pre-Contact sites along the lower Roanoke River in North Carolina and Virginia to determine the former abundance and distribution of certain fishes. Approximately 84,000 specimens from seven Late Woodland period (A.D. 800–1600) sites were studied. The study was undertaken to provide information that would be used by the U.S. Fish and Wildlife Service for regulation and plans for fishery

management, restoration of species, land management, and federal involvement in managing human activities on the land.

VanDerwarker (2001) identified many remains of fish from these sites and consulted Thomas R. Whyte of Appalachian State University to confirm the identity of several specimens, confirming the pre-Contact existence of largemouth bass (*Micropterus salmoides*) and walleye (*Sander vitreus*) in the Roanoke. VanDerwarker concluded that the evidence showed that dam construction had caused some disruptions to reproductive cycles of aquatic life in the area:

“...evidence that the native ranges of largemouth bass, channel catfish, and walleye may have extended into Roanoke River” (VanDerWarker 2001:1) or the fish were unable to reach as far upstream as they once could. “The identification of sturgeon at both Vir 150 and the Gaston site indicates that this fish swam further upriver to spawn in prehistoric times than is possible today. The zooarchaeological data are thus consistent with the hypothesis that dam construction has disrupted its reproductive cycle” (VanDerwarker 2001:43).

VanDerwarker claimed that her findings would be important to the U.S. Fish and Wildlife Service and would have an effect on current environmental policy (VanDerwaker 2001). However, VanDerwarker failed to identify any remains of the anadromous herrings, such as the American shad, a fish of primary concern to the U.S. Fish and Wildlife Service for considering re-licensing of commercial dams on the Roanoke (Whyte 2008).

Remains of one fish species VanDerwarker claimed to have found (channel catfish: *Ictalurus punctatus*) have not been found along the Roanoke or adjacent river systems by

other scientists. Other species that one would expect to see at this site were not identified by VanDerwarker. Whyte (2008) reanalyzed the fish remains due to concerns about why there was a major discrepancy in VanDerwarker's findings. Whyte mentions that VanDerwarker remarks that she did not examine the vertebrae to identify species due to the fact that they all look the same. This is an issue because vertebrae are extremely important to the identification of several species in the Roanoke River. According to Whyte (2008), one of the species missed by VanDerwarker is American shad (*Alosa sapidissima*). Whyte (2008) found that both site assemblages included vertebrae from shad and other herring, but almost no bones of the skulls of this important group of anadromous fishes. In other words, because VanDerwarker neglected to examine the vertebrae, herrings were not identified, not included as a component of the diet of the sites' residents, and not mentioned as a group of concern for the benefit of the U.S. Fish and Wildlife Service.

VanDerwarker explicitly states that her interpretations match her hypothesis, and that she believed the findings were significant. This indicates that she used confirmation bias, using evidence to prove what she believed to be true and dismissing evidence which would have contradicted her hypothesis (Casad 2019). Whether she was aware of her bias is unknown, as it could have been a subconscious behavior just as easily, motivated to discover proof that would please her employer and invoke environmental action. In addition, she may have been motivated by professional competition to provide evidence of new species in the area.

Archaeological Interpretations Based on Context and Conditions

Eccentric Mayan Flints

Mayan eccentric flints, also known as “eccentrics” or “flints,” are intricately designed flint or chert artifacts the purpose of which is unknown. They are defined as “*a lithic artifact that cannot be used as a functional tool or weapon*” (Fasquelle et al. 2016:10). However, they are designed to depict human-like heads in profile, typically wearing headdresses and often having an element that extends from the forehead which is thought to invoke a deity (DMA 2017).

In studies of the creation of eccentric flints, archaeologist David Freidel (DMA 2017) discusses how the creation of eccentrics demanded focus and required “extreme concentration” because of their delicate nature. The complex shapes and edges are so fragile that it is thought there was no possible way to have used the flints for cutting. Based on this fragility, combined with the flints occurring in ceremonial contexts such as tombs of elites, Freidel determined that the flints only served in a decorative capacity. Freidel also believes that these flints were talismans used to conjure spirits, help empower ceremonies, and therefore could not have been used as everyday cutting tools (DMA 2017).

Additionally, Ricardo Fasquelle and colleagues (2016) studied the eccentric flints of the Maya at Copan to discover their purpose. Fasquelle and colleagues focused on caches of nine “eccentrics” and three bifaces found at the site of Rosalila, excavated by Ricardo Agurcia Fasquelle in 1990. He noted the design and lack of damage to the buried flints, and also examined the context in which they were found. Shared features of a cranial torch, also discovered in images of the maize god at Rosalila, led Fasquelle and colleagues to conclude

that three of the Copan flints depicted the maize god. Fasquelle also interpreted the flints as having been used to call upon the force of lightning. He made this conclusion in part due to common knowledge that Mayans and other Mesoamericans associated flint, chert, and obsidian with lightning, and he interpreted the oblique notching on the flints seen in artifacts 90-5, 90-8, and 90-10 as invocations and depictions of lightning.

Fasquelle and colleagues' analysis of the napped edge of the extensions led them to dismiss common assumptions made by previous researchers that the items were scepters. They reasoned that the flints were not damaged enough to evidence regular use, and the sharp edge of the extrusion would have made a poor grip because it would have cut the hand. They concluded that the flints were too delicate for combat in the physical world. Due to the lack of damage, and the locations in which they were found, Fasquelle and colleagues concluded that the flints were made specifically to be buried and to act as weapons in the spiritual world (Fasquelle et al. 2016).

Fasquelle and colleagues admit that there are several inconsistencies in the figures depicted by the Copan eccentrics. For example, the sun god has a different style of nose than in other known depictions. This difference in the depiction calls into question the accuracy of his interpretation. Reevaluation should be made on whether there are enough matching features on flints to provide satisfactory evidence that the images depicted by the Copan flints are of the same Mayan deities seen elsewhere. If one deity's depiction at the Copan site is inconsistent with other known depictions, then Fasquelle and colleagues' conclusions about the purpose of flints may be incorrect.

In addition, researchers interpret the detailing of oblique notching to be representative of lightning, providing no other supporting examples. Fasquelle and colleagues argued that

because Mayans associated flints with lightning, the flints were created to invoke the power of the lightning deity. The interpreters also note the notching on the flints and use this connection to determine that the notching must depict lightning (Fasquelle et al, 2016). However, they fail to provide sufficient evidence to support that the flints invoke lightning and only provide evidence that the ethnographic groups in the area, possibly including the Mayans, thought that lightning created the materials used. Freidal along with Fasquelle and his colleagues may have also been motivated to interpret the flints as sacred due to internal biases about holy places. The flints were often found in ritual contexts, leading to the assumptions that the eccentrics were spiritual or holy objects. It is entirely plausible that instead these were used for major events or used for decorative purposes.

White Ibis Bones, Shell Mound, Florida

In 2019, Goodwin and colleagues reported on juvenile white ibis remains from Shell Mound, a 6th-century AD site in the Northern Gulf Coast of Florida. The investigators suspected the birds were used in feasting during world-renewal rituals, since these were probably gathered in abundance around the summer solstice. This is comparable to evidence of world-renewal rituals taking place during the summer at the time of agricultural harvests in later Mississippian societies.

The investigators cannot say for certain what role the white ibises played in relation to world-renewal, though they assume the birds were part of a feast, based upon unspecified historical accounts of consumption by northwesterners and westerners. Furthermore, it is thought that the birds were used for ritual feasting, rather than as a normal food source, because the gatherers would have had to travel to a rookery to collect the immature birds; the

nearest modern rookery is 12 kilometers away. While that distance wouldn't prevent the gathering of juveniles for food sources, it is commonly assumed that food procurement would normally have been highly localized. Finally, the bones found at Shell Mound were believed to be related to the ritual due to the concentrations of bird remains in the thousands. Little is known about the preparation and dressing of the bird remains, as it was done in a way that butchery, skinning, or burning left no marks (Goodwin et al. 2019).

Lacking this taphonomic evidence, researchers resort to other evidence to support their hypothesis that birds played a role in world renewal ritual. While investigators state that it is well known that birds were gathered for many uses, the only direct sources they provide that detail the eating of ibis meat are unnamed historical accounts of consumption by northwesterners and westerners. There is no direct proof that the people of Shell Mound, in fact, ate ibis meat. While the number of bones is comparable to the world-renewal rituals noted in later Mississippian societies, investigators mention that there are distinctions. Additionally, the Mississippian societies' rituals were focused on the first harvest of their agriculture. Reference to this evidence is a flawed comparison, as the investigators are using behaviors of Mississippian societies to set a precedent for this earlier Middle Woodland site. The team may have been motivated by professional competition, leading to sensationalization of the site's evidence by associating it with ritual behaviors.

Ultimately, the best support for their hypothesis of using ibis for ritual is the added effort needed to gather the ibises from a distant rookery (Goodwin et al. 2019). Yet, in a news article warning people to stay away from nesting migratory birds, Steve Giguere, park manager of Estero Bay Preserve State Park located on the Gulf coast, states that disturbing these birds can lead to the abandonment of the rookeries. Therefore, if the ibises were

disturbed year after year by hunters, and large numbers of their juveniles were hunted and killed, it is possible that the birds abandoned a rookery located closer to Shell Mound if they were once gathered as a regular food source.

Archaeological Interpretations Based on Modern Concepts of Value

Mayan Jade Objects

The accumulated value of an object is difficult to understand. Often it is the value of the exotic nature of the material or the product itself that is used in interpreting its value.

However, it is not just *who* has commissioned and exchanged the object but *how long* it takes to produce it and how many producers it may pass through. Crafting of highly valued objects in pre-Columbian Mesoamerica often involved multiple producers and segmented production.

In a study of pre-Columbian Maya jade, Kovacevich (2017) notes that the value comes from the labor that went into the creation of the artifacts, along with the identity of all of those involved in the crafting. Kovacevich claims that there is a connection that exists between creating a material object and creating human life. This connection of bringing forth life, whether to objects or humans, is common in several cultures and provides a basis for understanding the value of production. Kovacevich has deemed that the value of an artifact comes not only from the important crafters involved, but from everyone involved in production. These "hidden producers" work on the pieces and their individual methods would affect the overall value of the created objects. The evidence she provides for this idea of collaborative value comes from the equipment for crafting found in all Maya households and

ethnographic sources detailing stone-working technologies of the Maori of New Zealand, where children would aid in production. Kovacevich provides evidence that there were multiple individuals involved in the process of creating each artifact but does not provide evidence that this added value to the objects (Kovacevich 2017).

There is little physical evidence provided or referenced to explain how or why Kovacevich came to her conclusions that value was influenced by the individuals involved in production. Kovacevich does provide evidence that there were multiple individuals involved in the process, but does not demonstrate how this affected the value of an artifact. In the psychological discussions of Western theory about artifact creation, Judge and colleagues (2020) explain how beliefs regarding labor, both mental and physical, can cause an individual to perceive that value is imparted into the material artifact by crafters. This leads to individuals interacting with and interpreting artifacts differently than they would otherwise (Judge et al. 2020). Kovacevich's belief that the master crafter, commissioner, and many producers of an item influence the value is an excellent example of this psychological concept, especially since there is little to no physical or ethnographic evidence that the Maya themselves considered the objects made at these sites to be more valuable due to their methods of creation. Kovacevich was placing more value on the Mayan jades than there is evidence to support, possibly due to having subconsciously incorporated her own bias about the value of the craftsmanship onto Mayan culture. Furthermore, she may have been motivated by professional competition to create a new understanding on how Mayan culture viewed labor and its worth.

Context

Pink Handaxe, Atapuerca, Spain

The Pit of Bones at Atapuerca, Spain is a vertical shaft that once extended 14 meters (25 feet) from the surface. At the bottom were found more than 5,000 human bones accounting for 27 individual humans. The age of the pit is estimated to be between 200,000 and 600,000 years. In several years of excavation, only one artifact was recovered: a pink quartzite handaxe that is a reported 350,000 years old (Ricon 2003).

The placement of the pink quartzite handaxe nicknamed “Excalibur” in the Pit of Bones has led to some interesting hypotheses about the site and behaviors of early Neanderthals. The discovery of Excalibur was featured in a 2009 PBS documentary, *Becoming Human: The Last Human Standing*. According to the narrator, Lance Lewman, and Juan Luis Arsuaga, the director of the excavation, the site’s archaeologists believed that the placement of this sole man-made object within this burial site indicates planning and symbolic behavior (PBS 2009). Additionally, Juan Luis Arsuaga discusses how the unique color indicates the importance of the handaxe. Although quartzite is abundant in the area, the color is distinctive and therefore was interpreted as meaningful. Ricon (2003) discusses that Arsuaga specifically notes: “They would have needed to search it out. I think this colour held some significance.” Naming this handaxe “Excalibur” symbolically elevates its importance, by associating it with the legends of King Arthur (PBS 2009).

There are alternative explanations as to why this pink quartz handaxe was deposited in the Pit of Bones and why it is pink. It simply may have been dropped or had fallen in with the body of its owner. The idea that it was deposited purposefully is only one hypothesis, and

the archaeologists fail to provide evidence to support their claim that the item was deliberately placed there as they believe. There is no discussion of comparable sites from the same period or area with similar occurrences, or if the specific positioning of the handaxe at the site indicates specific intelligence or significance.

The archaeologists deemed the axe significant due to its presence in a burial site, its unusual color, and its singularity among the bones. The importance of the mortuary context is merely assumed, never proven. The lack of other artifacts of the same or similarly unique color could, instead, be interpreted to mean that the handaxe's color was not important. Furthermore, Christopher Stringer, of the Natural History Museum in London notes that, while there might be symbolic association, the Pit of Bones is possibly a secondary deposit and therefore any association between the artifact and the bones could be accidental (Ricon 2003).

The archaeologists at this site are displaying confirmation bias, the act of processing, looking for, or interpreting, information that matches one's beliefs (Casad 2019). They have found a single unusual artifact in a pit of bones. From this discovery, the researchers formed the hypothesis that the site was one of the first locations to show signs of ritual patterns involving burial. Essentially, the archaeologists searched for evidence to fit their theory. Yet, after five years they had yet to find any other stone tools. After 20 years investigators still had yet to find any other certifiable evidence to support their hypothesis (Ricon 2003; PBS 2009).

The uniqueness of the color of the quartzite used to make the Atapuerca handaxe needs further investigation before it can be regarded as meaningful. Is it possible that pink quartzite is more common in the region's formations than we know? Could the local quartzite

contain iron that oxidizes to a pink color when heated? Could the highly mobile Neandertals have made this tool from material obtained while foraging in regions far from the burial site? These questions need to be explored before assigning sensational value or meaning to “Excalibur.”

Finally, bias is further displayed by researchers’ treatment of the artifact and the way they appeared to hold “Excalibur” with reverence. This reverence could indicate an emotional attachment to the axe, and a need for the axe to have meaning. By drawing a picture of Excalibur on the artifact bag, they show they may have subconsciously placed undue emphasis and value on the axe by further connecting the artifact to the famous Arthurian legend (PBS 2009). Focusing on the perceived uniqueness of this object led to an assumption involving the intelligence and spirituality of early Neanderthals.

Chauvet Cave, France

Warner Herzog is a filmmaker and not an archaeologist. Despite his lack of archaeological authority, his film about Chauvet Cave, France is commonly used as a teaching aid in many archaeological classes and influences young archaeologists (Herzog 2010). His interpretations, and the methods he uses to form them, potentially impact the perceptions of anyone who watches the film. This makes it important to discuss his work, and any potential fallacies.

The Chauvet-Pont d’Arc cave, better known just as Chauvet cave, is arguably an important archaeological site. The original entrance of the cave had naturally sealed, the features of the cave have been protected and preserved so well that in some places the paint still appears to be drying. Consequently, the cave paintings are in such excellent condition

that they surpass nearly all others that exist. Warner Herzog is one of the last individuals allowed to enter the cave before it was closed off by orders of the French government to protect the art. In the cave there are many paintings of animals. For the archaeological interpretations of the documentary, Herzog focuses on one particular painting for a large portion of the film. Wrapped around a stalactite, there is a painting that appears to depict a bison and a woman coming together to form a hybrid being. Herzog interprets this as an important feature, comparing the image to similar fertility idols found at other (possibly affiliated) locations. Herzog discusses how this singular painting might be one of the earliest depictions of female human form to exist.

Herzog also highlights other features of the cave, such as an eight-year-old boy's foot imprint in the ground found next to the imprint of a wolf's paw, and dramatically speculates if it is possible that these two walked side by side. He also states that a bear skull was placed upon a tall stone formation making it appear as though it is sitting upon an altar. The placement seems to be deliberate, according to Herzog, who experienced a feeling of "strange spiritual aura." Although likely informed by professional consultant archaeologists, all these descriptions, carefully crafted by Herzog, are for maximum melodramatic effect, working to attribute significance to these objects (Herzog 2010).

Herzog presents nearly no relevant evidence from archaeological sources for anything that is seen in the caves, and has no archaeological authority himself. Fertility idols found in other sites are brought to compare to the image, but there is no evidence that these idols, or their creators, are connected to Chauvet cave. There is nothing to substantiate the interpretation they were made for similar reasons. When the intersection of the bison with the human is discussed, Herzog provides no evidence to connect the painting to the fertility idols.

The boy's footprint next to the wolf's paw print is just discussed for the film's ambiance. There is no evidence beyond proximity that the two prints are linked. Additionally, there is no evidence that the bear skull was placed there purposefully. It is possible that such an event occurred naturally.

Herzog is attempting to prove the importance of the cave to the masses, using features and artifacts for sensationalism, but providing no inference backed by comparative evidence. Instead, Herzog is using a layperson's logic to heighten the "magic" of the cave. Although the cave art is uniquely well-preserved and includes images not found at other sites, there are many ways to interpret the meanings of the images without resorting to sensationalism. Herzog was motivated as a filmmaker to make an interesting documentary by sensationalizing interesting and notable features before the cave was resealed.

Gorgets at Pig Point site, Maryland

The Pig Point site on the Patuxent River in Anne Arundel County, Maryland has been "proven," according to Luckenbach and Melton (2013), to have been a significant ritual site for prehistoric populations. Five centuries of mortuary behavior and indicators of other forms of ritual significance have been identified. A large number of slate gorget fragments were found, many of which were recovered downhill from the mortuary and ritual contexts. The gorgets appear to have been purposefully broken, or "killed," and several have subsequent modification, including fine-line incising, gouging, and battering (Luckenbach and Melton 2013).

Although broken gorgets are sometimes found outside of mortuary contexts, they are seldom identified as having been "killed," possibly *because* of their contexts. Luckenbach

and Melton (2013), in studying gorgets and their contexts, investigate the possibility that “killed” gorgets might exist outside of mortuary contexts at Pig Point. They compile evidence from multiple sources that provide examples of cases in which investigators immediately label gorgets in mortuary contexts as “ritually broken” while ignoring the gorgets found elsewhere. These sources, according to Luckenbach and Melton, rarely provide scientific justification for this distinction.

Luckenbach and Melton (2013) focus on the treatment of gorget remains and the material buried with or on the dead, alongside the materials held and carried by the living during rites. They also examine the crafted contexts, such as graves, and the ceremonies in the rituals. The fact that “killed” gorgets have been found within and outside of mortuary contexts means that researchers cannot conclusively connect gorgets with death and burial rites based on context. Modern day perspectives of rites and burial have shaped the meaning of gorgets and have resulted in the biased belief that gorgets are always “killed” if found broken within mortuary contexts, and have no ritual association outside of mortuary contexts. This possibly connects to contemporary behaviors of cleaning and maintaining mortuary sites, as it would indicate that anything found within mortuary contexts would be there purposefully. Mortuary contexts are important in archaeology, as the information found theoretically could tell interpreters about societal values, what artifacts were considered more important by the society, and what had spiritual meaning (Chesson 2001). This importance leads to a tendency for archaeologists to identify broken objects found with burials as having been intentionally broken to release the spirits of those objects so they can accompany the dead into the spirit world. However, it must be shown that the breakage was intentional, and

it must not be assumed that broken objects found in non-mortuary settings were unintentionally broken.

Toad Bones in the Appalachian Summit, North Carolina

Toad bones, numbering in the thousands, have been found in pit features and other contexts at village and mound sites in the southern Appalachians (Whyte and Compton 2020). It is purported that these remains are evidence that the toads were eaten, used for the hallucinogenic properties of their venom, used for ritual, or were trapped naturally. However, there is a notable lack of bones from the toads' heads, especially at Coweeta Creek, Warren Wilson, Garden Creek, Ravensford, and Smokemont where thousands of toad remains were found in pit features (Whyte and Compton 2020).

Whyte and Compton (2020) refute interpretations made by Runquist (1979) that the toad remains at the Appalachian Summit sites indicate that toads were decapitated and skinned so the head and skin could be used for ritual, medicinal, or ceremonial purposes. Runquist discusses evidence that toad venom can be smoked as powder to cause hallucinations. Toad venom, often mixed with other ingredients, has been used by several cultures for medicinal and ritual purposes. Additionally, toad skin secretions had pharmacological properties.

Whyte and Compton (2020) also challenge Runquist's claim that the toads, had they naturally fallen into the pits, could have escaped. According to interviewed excavators, the pit features would retain water after heavy rains for many days. Noting that shallow puddles are attractive breeding grounds for toads, Whyte and Compton suggest that these pits would

have attracted toads for breeding, after which they would have been unable to escape unless the water had completely filled the pits.

Whyte and Compton (2020) undertook experiments to determine if the lack of toad head bones at the sites could be explained naturally. This was done through the sorting of toad bones recovered from window wells of a 60-year-old house in Howard County, Maryland. They found that there were *slightly* fewer head bones relative to postcranial bones recovered from the window wells, but almost none were recovered from the five Appalachian Summit archaeological sites examined: “Although the window-well experiments indicate that skeletal part representation is biased due to preservation and laboratory processing, this extreme disparity cannot be explained exclusively due to these processes” (Whyte and Compton 2020:20). They note that toad bones from a far older site in the same region included a larger proportion of the head bones, indicating that the disparity cannot be explained by the differences in preservation at the sites. Nor can the disparity be blamed upon the sorters, as the data was reviewed by an individual very familiar with the osteology of toads (Whyte and Compton 2020).

Trying to understand the disparity, Whyte and Compton (2020) refer to a recipe found in a Cherokee cookbook (sourced from Ulmer and Beck 1951:51) that indicates the possibility that toads were decapitated and skinned to remove the toxic portions of the toad before consumption. This means that toad remains in archaeological middens are not always evidence of toads being used specifically for hallucinogens, rituals, or medicine. Whyte and Compton infer that this preliminary processing would have been done at the capture site to facilitate transport of the toad meat and to avoid toxins when the meat was consumed. This evidence led Whyte and Compton (2020) to conclude that the individuals residing in the

Appalachian Summit were “almost certainly decapitating and consuming toads” (Whyte and Compton 2020:20).

The dismissal of ritual involvement due to lack of evidence is not completely substantiated by Whyte and Compton. The actions of beheading and skinning of the toads at the capture site could have had ritualistic connotations. In an account of ritual treatment of animal remains recorded by Ruth Landes in her observations and discussions with the Dakota people of Prairie Island, the Dakota peoples spoke with her about the importance of certain practices in a winter bear hunt, as well as the subsequent treatment of the remains of the animals' bones to show respect for the animal. By placing the bones next to a tree, the Dakota believe they were respecting the bear's spirit, and afforded themselves "divination for future success in hunting" (Landes 1968). It is possible that the toad hunters practiced a similar ritual; hunters may have believed they were returning the animal's spirit back to the wild when they left the heads and skins at the places of capture.

Bear Bones at the Crace Site, Minnesota

According to ethnographic sources, bear feasts were major events for Native Americans of the Midwestern U.S., involving massive hunts. Mather (2020) discusses ethnographic descriptions by 17th-century French explorer, Nicolas Perrot, to interpret bear remains from the Crace site (21ML3), a Late Woodland occupation in Minnesota. Mather believes that the Crace site is the location of a bear feast, correlating to descriptions given by Perrot. The Crace site was excavated with focus on a particular feature containing 3,410 bone fragments, 338 of which were identified as black bear, and 275 of which are black bear remains. Another oval feature contained the heads of at least 32 bears. Lacking teeth and evidence of

burning, it was determined that the heads had been cooked. The large number of skulls and other remains indicated to Mather (2020) that this site must represent a large gathering of people who were involved in the hunt and subsequent feasting.

Mather states outright that the widespread belief that bears were a regular part of the human diet in the Late Woodland period of the region is mistaken, and likely resulted from early archaeological studies at the Mille Lacs site, where only larger bones of larger taxa were preserved and recovered for identification. This ‘knowledge’ became widespread and led to many archaeologists assuming this as fact. What Mather does not provide is evidence that hunting parties would have been exceptionally large and taken several days.

Additionally, Mather (2020) fails to consider other ways in which large numbers of bear remains may have been deposited in the Crace site features. For example, it is possible that the bear remains resulted from numerous periodic hunts involving few hunters and were later gathered together to be deposited in their final archaeological contexts. Furthermore, Mather provides no ethnohistorical evidence about hunting methods or data on the bear ecology.

Without considering other possibilities to explain the evidence, one may conclude that Mather is favoring a ritual-deposition and large-scale-hunt explanation in keeping with a contemporary popular archaeological theory – the search for ritual in the archaeological record.

Discussion

One common source of bias comes from interpretations about the contexts of things found on archaeological sites. This is very likely due to postdepositional processes affecting the

evidence over time. Consequently, archaeologists claim the freedom to interpret the contexts in ways that are biased, often supporting their ideas with evidence from articles of the interpreter's choosing, while leaving out contradictory studies. An interpreter's analysis about how and why past societies behaved as they did is often a result of their own ideas and individual experiences.

Another is confirmation bias. Arsauga's (PBS 2009) interpretation of "Excalibur" at Atapuerca, Ward's (1990) interpretation of the elk bones at Garden Creek, Rodning's (2010) interpretation of colored sediments at Coweeta Creek, and VanDerwaker's (2001) study of the fish remains from the Roanoke sites are all examples of confirmation bias in archaeological interpretation. All of these archaeologists focused on one hypothesis and sought to prove it, and often dismissed or did not investigate contradictory evidence.

Among the case studies, there are many instances where the word *importance*, or a variation of it, is used in describing the way the interpreters view the phenomena they discover. By singling out an important phenomenon, an interpreter is attempting to place significant value or bring attention to the fact that their discovery is profound. This bias is often a result of deeper, internal motivation. In a CNN report, psychologist Orville Gilbert, discusses the human desire to become famous. Gilbert speaks about how humans need to be part of a group, and how belonging drives them to seek attention from, and gain the approval, of others (Landau 2009). Archaeologists are humans; they might subconsciously add importance to their findings, to their work, and to their conclusions for the approval and attention of their peers.

Conclusion

This examination of examples of archaeological hypotheses and theories involving color, material record, material composition, and context reveals evidence of bias among archaeologists in their interpretations of archaeological evidence. Bias can be attributed to many factors, including personal experiences and beliefs, previous knowledge, a desire to confirm specific theories or conform to accepted ideas. As a result of bias, many archaeologists do not thoroughly consider contradictory points and evidence. Each of the case studies presented here exhibits some form of bias in arriving at conclusions, and in some, hypotheses were advanced without consideration of alternatives.

In archaeology, interpretations must be made with as little bias as possible, and conclusions must not dismiss contradictory evidence without explaining why. Therefore, it is disconcerting when archaeologists include biased interpretations and do not explain why they ignored contradictory evidence. While archaeological phenomena can be interpreted in many ways by different people, researchers should attempt to identify and avoid their own biases, discuss alternative explanations, and explain how and why a certain interpretation of the evidence was supported.

When biased interpretations are used to build connections to other sites and understand the past, misinterpretations may result, and it can often take years for the archaeological community to become aware of them. By understanding potential ways biases occur and how cultural perspectives affect interpretations, archaeologists can work towards reducing the spread of incorrect information and instead ensure archaeological findings and publications are impartial and based on sound evidence.

There are several possible remedies to reduce bias in the field of archaeology. However, these remedies are not going to resolve the problem immediately, and will likely require trial and error to find the best solution. The simplest solution would be to have an author who is known to prefer contradictory hypotheses to evaluate the research and publications for bias. While peer-review does take place in certain publications, much of the archaeological literature consists of technical reports that are not peer-reviewed, and much of what is made available to the public, such as documentary films and popular magazine articles, is sensationalized. Additionally, the reviewer should be extremely opposed to the writer's hypothesis as such individuals will be the ones to criticize issues the most.

Archaeologists must also ensure that the context of every phenomenon seen at a site gets discussed separately to explain exactly how each item affected the interpreter's conclusion, allowing for readers to notice any bias or mistakes in the interpretations. Another solution would be for archaeologists to consider all possible hypotheses, explain any flaws, and how evidence fails to support any of these hypotheses. If we fail to refute a hypothesis, then it remains a viable explanation until new evidence or explanations refute it. This is often a difficult job for archaeologists due to the nature of contexts; however, any ideas that are speculative need to be presented as provisional and all evidence should be disclosed. If an alternative conclusion exists but has little evidence to support it at the time of presentation, it should not be left out, but rather presented and noted for what it is, one possible explanation.

Next, it is important for anthropologists and archaeologists to engage in continuous professional discourse and stay informed about new techniques or methodologies that will aid in preventing the dismissal of evidence that contradicts a hypothesis. If using ethnographic sources, do not only highlight the supporting evidence, but also include

contradictory observations, analyzing the implications. Often the approach to fields of discovery, like that of archaeology, is one of competition. However, peer collaboration should be encouraged and expected. Furthermore, archaeologists and anthropologists should be honest about their shortcomings or areas of inexperience.

Finally, it would be advantageous for archaeologists to collaborate and develop a standard method of identifying bias. This would permit archaeologists to self-evaluate their techniques and the way they reach conclusions, as well as a tool to evaluate others' work. Standards would help archaeologists to recognize their own biases, as well as better recognize bias in others. As a result, interpretations would be more objective and there would be more transparency in the discipline.

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