The Taboo Relationship of Ancient Art and Science

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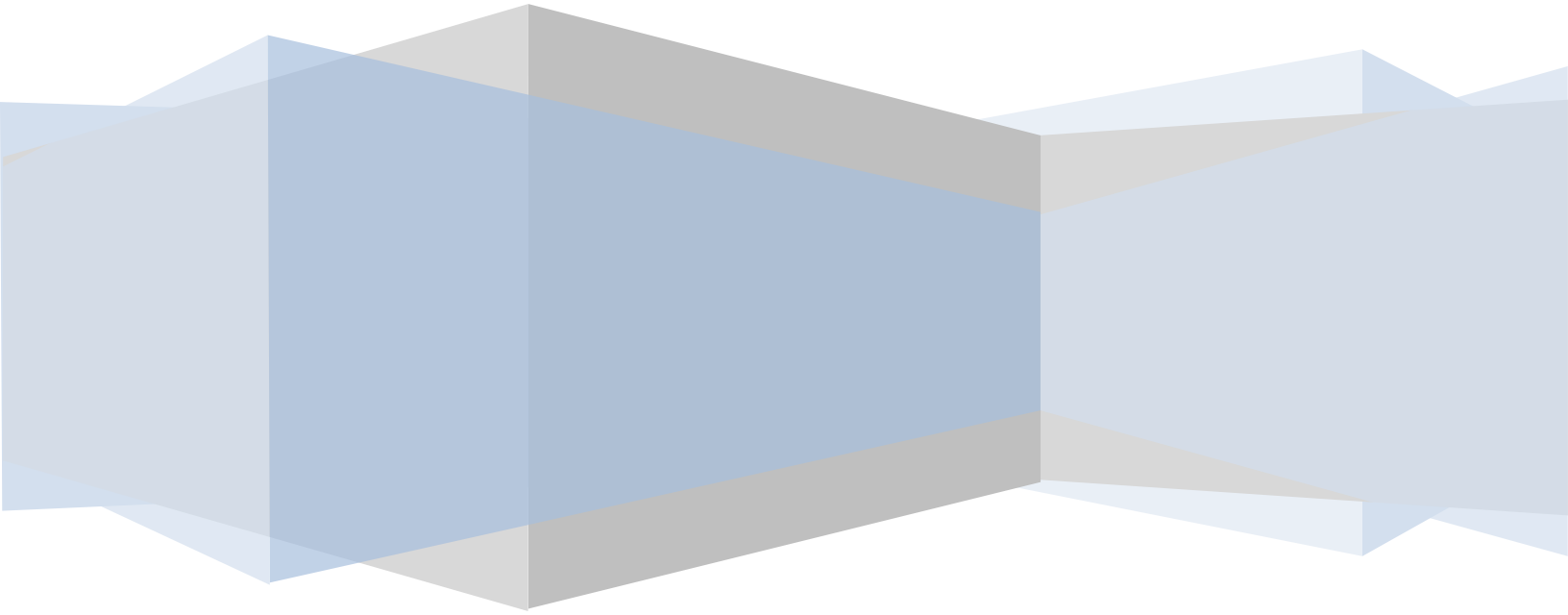

With the advancement of technology and science in relation to art and archaeological discoveries, specifically with artifacts from the period of Ancient Art, the debate of progress in identification combats traditionalist views of art as purity in the form of expression, and challenges fraudulent pieces within collections based upon the facts of science and allows for undisputable identification of works.

While archaeology is considered to be a secular science, truthfully the excavative studies culminate the humanities, social sciences and natural sciences into a singular cohesion. With such distain having developed between scientific analysis of archaeological discoveries, and the art community, the overall argument of scientific dating of artifacts becomes that much more intriguing to investigate deeper into.

Evidently enough, the practices of archaeology and art history have long since developed before that of scientific analysis and have evolved numerously in their application and process. Early archaeology began as a crude form of discovery of ancient pieces and was less strategic and systematic in comparison to its evolution today. Relying heavily upon excavation during its foundational stages, archaeological sites took season after season of digging with no definite guarantee of any important historical discoveries. Simply put, "excavation recovers from the earth archaeological evidence obtainable in no other way"[1]. To be frank, archaeological excavations during the nineteenth century were rudimentary and chaotic in execution. Excavators utilized no specific method other than merely recording "only those things which appear to [excavators] at the time"[2] to be anything of significance. The keeping of detailed logbooks of daily activities was not a common act amongst archaeologists, thus making any discoveries of historical significance incredibly questionable in their credibility.

It was not until the middle part of the twentieth century that under the influence of Sir Mortimer Wheeler, that the gridding and three-dimensional recording of dig sights became the prevalent norm utilized by excavator foremen. Representing problems and limitations of its own, gridding often resulted in "economical,

[1] Barker, Philip. Techniques of Archaeological Excavation. London: The Anchor Press, 1982, p.27
[2] (Barker), p.15

swiftly obtained microcosm of the site's development and led to the trial trenching of hundreds of sites, with results being used as the basis for generalized statements about the whole site"[3]. Such uneducated presumptions often led to poorly interpreted information and left many sites unsampled and dependent to rely upon generalized information for analyzing the sites, thus resulting in historical and anthropological theories determined out of proper context. To remedy such oversight, larger sample areas began to be utilized, and each specific site is independently sampled from one another to produce a more concise and theoretically accurate hypothesis.

Beyond specific site methods of excavations, it is also important to note the important training and procedures inherent to archaeologists themselves to follow. Danish scholar Christian Jurgensen Thomsen is often noted for his specialized eye in determining chronological time frame of findings just by purely, "paying attention not only to the material of which the artifact was made, but also to shapes and decorations, and to assemblages of artifacts excavated"[4]. Such attentiveness to detail by the archaeologist becomes a crucial quality when it pertains to identifying integral artifacts uncovered at a site versus meaningless clutter potentially discovered.

Overall, early archaeologists were dependent upon only a microscope, dental pick and their own perception -and historical knowledge in order to determine information from ancient pieces, leaving a large gap where error, misinterpretation or a complete lack of identification could have easily occurred.

Art History's own humble means stifled proper identification of ancient relics, and thus, has led to improper classification of older pieces and caused the need for new investigation to be pursued. Without properly coordinating with the archaeologists who have unearthed these historical finds, art historians continue

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[3] (Barker), p. 15

[4] Weiner, Stephen. Microarchaeology: Beyone the Visible Archaeological Record. New York: Cambridge University Press, 2010, p.8

to interpret items upon the basis of generalized knowledge and rules of methodology in art history of time periods and indigenous people of the excavated area. Such stubborn and ignorance on the part of art historians of the earlier period has labeled art and science as two secular specialties and initialized the stigma between a cooperative involvement between the respective fields of study.

With the renaissance of the archaeology field and the introduction of scientific measures and various testing within the twentieth and twenty-first century, new practices and applications arose aiding in more accurate diagnostics of ancient artifacts. "Compared with the situation as it was only fifteen years ago [based on nineteen eighty-two], the amount of information which can be added to and deduced from excavated evidence by scientific means is enormous and increases annually"[5] for as scientific knowledge and understanding increases, so does the possibility of increased understanding of ancient artifacts. Some scientific analyses are more accurate and commonly used when dealing with ancient remains than other more newly developed and untested forms of scientific analyses that possess a higher marginal error.

One of the initial scientific crossovers into archaeological and anthropological studying would be that of radiocarbon dating, meaning in more simplistic terms, that any death of a living organism has measurable organism decay at a constant rate. "The material to be dated has to not only contained carbon, but also only carbon that was derived from carbon dioxide in the atmosphere and was incorporated into the material at the time was formed"[6], meaning all organic matter can be accurately dated by utilizing radiocarbon dating. Based upon this set of parameters, even the carbon in ancient bone can be accurately tested and dated, as long as it did not exchange any of the carbon it contains during burial. This includes the ability to analyze charred remains which previously could not be thoroughly examined as they were thought to be contaminated and lacking usable data. With the only possibility of error discretion being that of a few tens of years, carbon dating

[5] (Barker), p.20
[6] (Weiner), p.19

provides the most accurate form of ancient artifact dating available other than written, certifiably exact documentation which is few and far between when handling ancient artifacts.

DNA itself has been a key tool in taking archaeological finds and giving them a scientific context in which to be analyzed as well as a definitive place within ancient art and archaeology. Through studying mitochondrial DNA (further referred to as mDNA), a single copy of genetic traits that "is inherited only through the females of the previous generation"[7], the individual genetic makeup of a specimen. This means that several DNA samples from various human remains can be thoroughly analyzed and genetic relations can easily be determined through their respective matriarchal donor. In combination with carbon dating, mDNA allows for not only the identification of family members and their relation to one another, but also any maternal inherited disease or disorders to be identified.

With these various scientific advances and forms of experimentation, the question arises as to its practical application to the archaeological and art historical fields and its significance in deciphering historical significance. Simply put, "it is useless for the field of archaeologist to try to work in isolation from the geologist, the geographer, the pedologist, the climatologist or the ecologist"[8] but when, working together as a singular entity, monumental discoveries can be made.

The most notable discoveries revolving around the collaboration between art and science, even in the past twenty years, seem to primarily surround scientific testing of ancient human remains rather than ancient pieces of art, though both receive mass amounts of scrutiny by those in the art field. Notably, the analysis of ancient Egyptian mummies has risen to be the pioneering force behind scientific and archaeological collaboration. Though it is only recently that Dr. Zahi Hawass, Egypt's Antiquity Chief, has allowed for the scientific testing to be conducted on such mummies as King Tutankhamen and Hatshepsut, the information that has since been

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[7] Hummel, Susanne. Ancient DNA Typing. Berlin: Springer-Verlag, 2003, p.21

[8] (Barker), p.28

gathered is remarkable and otherwise unknowable without the aid of DNA testing and other scientific measures being undertaken utilizing the remains.

Mostly known as being the boy king who ruled Egypt, little else has been known about the life and death of King Tutankhamen. In two thousand and eight, Hawass allowed scientists to step in and begin several rounds of DNA testing, including mDNA, as well as the performance of computed tomography (hereon referred to as CT) scans that allow the development of a three-dimensional image of the inside of an object revealing startling and exhilarating results. "Egypt's famed King Tutankhamen suffered from a cleft palate and club foot, likely forcing him to walk with a cane, and died from complications from a broken leg exacerbated by malaria, according to the most extensive study ever of his mummy."[9]

The two yearlong studies not only revealed King Tutankhamen's cause of death and life ailments but was utilized in establishing the beginnings of his family tree, stating that "Akhenaton, the pharaoh who tried to revolutionize ancient Egyptian religion to worship one god" (Schemm) was undoubtedly his father and also suffered the same genetic disorder of club foot, though less severe and deadly than his son. The scientific results also helped archaeologists give a more educated guess as to why King Tutankhamen was buried with over one hundred walking sticks, sighting that his club foot, and later the inset of severe malaria, would have forced him into needing an aid for walking, ruling out previous responses that they were only for ceremonial means. Scientists along with Dr. Hawass' aid concluded that the combination of King Tutankhamen's clubbed foot and contraction of malaria led to his inevitable and infamous early death.

Hatshepsut's remains were identified along with her nanny's, through the extraction of nuclear and mDNA. Again, under the supervision and permission of Dr. Hawass, the two mummies earlier referred to simply as KV60A (Hatshepsut) and KV60B (her nanny), in two thousand and seven, around the same time as King Tutankhamen, DNA was extracted from the respective human remains and the samples underwent years

[9] (Schemm) msnbc.msn.com, 2010

of analysis. A tooth found in a small container also in the funerary tomb of what is now known to belong to Hatshepsut, matched perfectly into the jawline of Hatshepsut and allowed for more analysis to be pursued to ensure the identity of the mummy as Hatshepsut. Through scientific studies performed on her mDNA and that of another mummy, scientists were able to label Ahmose Nefertari as being Hatshepsut's Grandmother, the "matriarch of eighteenth-century dynasty royalty"[10] that most Egyptian royalty has been genetically and historically linked to.

When the opportunity of scientific testing arose towards the Grecian "Mask of Agamemnon" discovered at Mycenae in eighteen seventy-six by Heinrich Schliemann, strong distain rose from not only the museum faculty but the people of Greece. With fear that their greatest museum treasure may in fact turn out to be an elaborate hoax and fake, the National Archaeological Museum in Athens has been reluctant to test the mask, there are a number of procedures available to determine authenticity in addition to that outlined by Traill. The simplest and least damaging is X-ray fluorescence, which could reveal whether or not the gold was alloyed with other metals. Minoan and Mycenaean gold, "when mined or panned, were typically composed of between five and thirty percent silver."[11] Any potential impurity, whether it turn out the mask is composed of pure gold or contains high amounts of copper would lead many experts concern towards the mask's legitimacy as an ancient relic.

Such strong distain raises many questions, such as: is it right to be potentially showcasing a fraud? Is it the museum's right to refuse scientific testing upon a piece? Though it is evident, the relationship between science and the arts has grown dramatically over the past decades, but it seems imperative that the boundary is still there. While many art historians speculate about the origins and meaning of a piece of art, their taboo, laissez-faire nature towards scientific analysis seem to be more self-serving than anything else. With the potential of

[10] (Scientific Blogging) www.science20.com, 2007

[11] Harrington, Spencer. www.archaeology.org. July/August 1999. <http://www.archaeology.org/9907/etc/epilogue.html>.

great discovery through scientific aid also lies the high risk of unearthing that an artifact may not be what art historians and archaeologists have speculated it as for decades on end.

Understandable the strong refrain felt towards ancient artifacts being tested, the matter of fact is that the potential reward of knowledge otherwise forgotten along with the people of an ancient world is more important than the rare likelihood of a fraudulent piece. While it may change the assumed use or story behind a piece of art, science through its various ways of testing could open up the path for new ideas and theories to be postulated about an item and allow for a more educated and full understanding of ancient civilizations and how they functioned. As art historians, archaeologists and anthropologists, it should be of greater concern the historical accuracy of a piece of work as opposed to its imagined glamour fabricated upon little evidence discovered at a site.

Through more intense collaboration, maybe even including scientists to partake in excavative activities, it would be ideal to strengthen the respect and mutual work of the sciences and the arts in order to properly preserve and understand ancient pieces of art. Though the sciences and the arts represent two opposing classes of thought and of characteristics, the two clear complement one another and allow for exponential growth to manifest in their respective fields through the sharing of information, test subjects and ideas of investigation. Science allows for the base, rash facts to be obtained more accurately than otherwise possible, whereas art provides an anthropological background of the life of ancient peoples and the ability to transcend detail upon relics into the importance and livelihood of individuals. While it seems, it will take a few more decades to acquire such harmony between the two fields, it observes as an inevitable if both wish to move forward and to reiterate a complete, truthful investigation of the ancient world.

Reference Images

Reference of Images: (all images obtained through the use of Google Images respectfully)

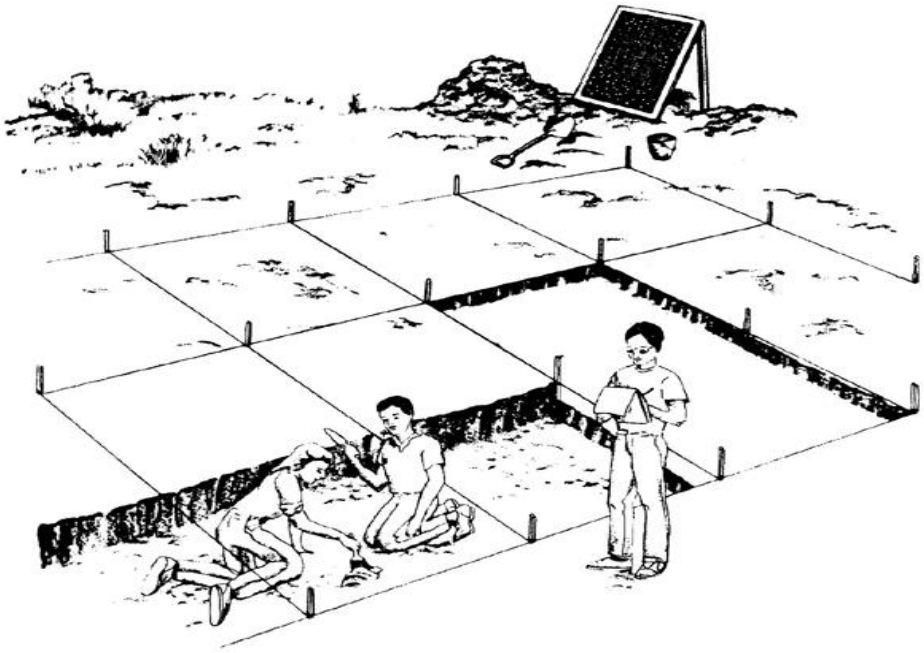

Figure 1: Example of a Gridded Archaeological Dig Site

Figure 2: Dr. Hawass with King Tutankhamen's Remains during CT Scans

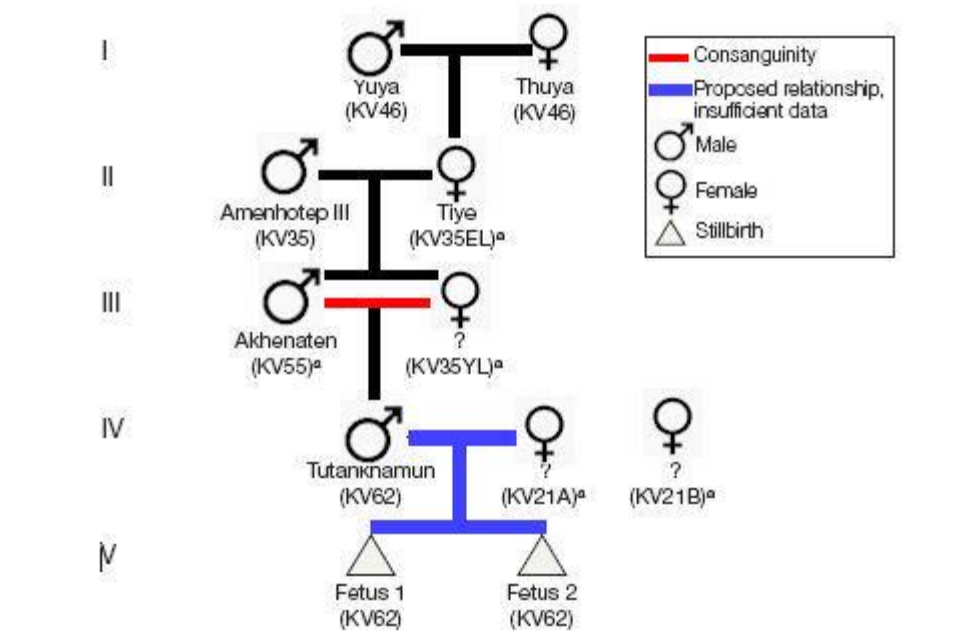

Figure 3: Results of King Tutankhamen's DNA Tests

Figure 4: Mummy of Hatshepsut

Figure 5: X-ray of Hatshepsut's Jaw

Figure 6: Mask of Agamemnon

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