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HISTORY WILL SAY THEY WERE FRIENDS: REFLECTIONS ON aDNA AND GENDER IN ARCHAEOLOGICAL CONTEXTS

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INTRODUCTION

Gender is extremely complex. Expressions and understandings of gender change through both space and time. What is considered the norm in one culture might be unusual in another. Cultural anthropologists engage in participant observation of societies to explore their understanding of gender, as well as many other complex topics. As archaeologists our studied populations are no longer alive and can only be studied through archaeological remains and historical records. For these populations, how do we examine complex topics, such as gender? Typically, biological sex is determined through osteological techniques and compared to accompanying grave goods to ascertain gender. Osteological analysis can be inaccurate when sexing a skeleton due to either degradation of the remains or age of the individual at death, as well as osteological sexual dimorphism being a spectrum. Recently, ancient DNA (aDNA) analyses have assisted in confirming biological sex for remains that have been considered indeterminate in the past. aDNA has also revealed that there have been cases of individuals who have been mis-sexed through osteological analysis, thus allowing for a more in-depth study of sex and gender for those individuals. This article aims to discuss the possibilities and realities of using aDNA to assist in archaeological gender studies and to continue a dialogue concerning studying non-binary gender identities and non-heteronormative sexualities in past communities.

SEX, GENDER, AND ARCHAEOLOGY

The seminal work of Conkey and Spector (1984) began the discussion of gender in archaeology. Prior to this article, archaeologists did not appear to be interested in the idea of gender, instead they focused on the biological sex of an individual and their perceived role in a culture. These studies were mainly based on Western, heteronormative ideas of masculine and feminine (Conkey and Spector, 1984, 1). Conkey and Spector called for gender-inclusive reconstructions of the past in which we no longer linked activities to specific sexes and where we highlight female and non-binary individuals who were so often invisible in the past. Their article discussed issues of gender almost a decade before DNA analysis was possible among modern populations, let alone ancient DNA, but their ideas allowed a conversation about archaeological gender and ancient expressions of gender to begin.

Biological sex and gender are not synonymous. Gender is described as "learned behavior, resulting from historically specific processes of socialization" (Gilchrist, 1999, 9), whereas sex is determined by DNA and sexual dimorphism. Some researchers believe that gender may be influenced by biology. These studies are usually driven by the idea that humans have an inherent need to procreate (Gilchrist, 1999, 9), but this negates any sexuality or gender identity other than binary heterosexuality. Although, this is not to say that biological differences do not influence how individuals are perceived by

society. Gasparini et al. explain "sex and gender enclose different concepts and meaning, the latter being a product of self-identification, socially and culturally constructed and considered as the communal interpretation and representation of biological differences" (2022, 5). Articles discussing the connections and differences of biological sex and gender are ongoing today (DuBois et al., 2021; Fredengren, 2021; Garofalo et al., 2020).

In archaeology, gender has traditionally been explored through an examination and identification of grave goods (Eliášová et al., 2009, 69). By identifying the biological sex of the individual associated with the grave goods, we can better understand gender. For example, there have been many cases of biologically female individuals buried with either entirely male or a mixture of male and female grave goods. These cases, and similar cases showing males with female grave goods, have been thought to represent either third-gender, intersex, or non-binary individuals in the past. Although we have no way to confirm these individuals' gender identities or sexualities, we can see that the past was not the binary, heteronormative world past archaeologists described it as.

ANCIENT DNA AND GENDER STUDIES

Much like gender, biological sex is also a spectrum. The skull and pelvis are the most sexually dimorphic parts of the human skeleton. When performing osteological analysis, biological anthropologists and bioarchaeologists use a scale to determine the degree of 'femininity' and 'masculinity' of the skeletal landmarks. This scale is typically one to five, with one being very female and five being very male. Kranzbühler describes this as the 'Barbie and Ken vs. public transport phenomenon', in which "'ideal' types of male and female bodies are used to define the end positions" (2019, 128). These end positions are the 'Barbies' and 'Kens', while everyone else on the scale are the regular people you see on public transportation. As a result, individuals can be determined to be: (1) female, (2) probable female, (3) ambiguous/indeterminate, (4) probable male, (5) male. This means that it is very possible and usually common to have individuals whose osteological analysis shows as ambiguous or indeterminate due to their ranking on this scale. Juvenile and younger individuals will almost always be indeterminate using osteological methods due to their still developing skeleton. Degradation of the remains can also play a significant factor in an archaeologist's ability to determine the sex of the individual. Finally, osteological sexing can be inaccurate simply due to human error.

Over the last two decades, DNA analysis and other scientific methods have been used to confirm biological sex for archaeological remains. Although, like osteological analysis, aDNA is not perfect. Degradation of the samples can result in indeterminate sexing or even mis-sexing of an individual. In 2013, a study was conducted to determine if degraded DNA – both modern and ancient – reduces replicability in analysis and thus causes errors (Kim et al., 2013). They determined that there is a drop-out zone for the Y-chromosome that, if reached, can mis-sex an individual to female because of the loss of the Y-chromosome. From extractions of 90 ancient samples, "female identification of nine aDNA samples was unreliable" (Kim et al., 2013, 60), showing that only 10% of the samples were potentially mis-sexed. Degradation and contamination are an issue for aDNA extraction throughout the field of archaeology simply due to the fact that the material we are working with is often extremely old and is usually collected in the field. That being the case, aDNA has been known to be useful for confirming biological sex of both indeterminate and sexed individuals in the archaeological record.

For example, burials of 'horsemen' in necropolises in Molise, Italy were the subject of a study focusing

on both biological sex and gender. The remains of 19 'horsemen' were examined through osteological analysis to determine biological sex, but, due to poor preservation and the age at death of some individuals, some individuals were unable to be sexed (Gasparini, 2022, 2). As such, enamel peptide analysis was employed, and the archaeologists were able to confirm the sex both the ostemetrically identified individuals and the indeterminate individuals. Gasparini et al. explain, "having confirmed the studied horsemen were biologically males and that sex corresponds to archaeological gender, it is relevant to better define and understand the social structure of the population of a Campochiaro" (2022, 5). In this case, the biological sex of the remains matched the gender of the grave goods, but what if they had not matched? What about cases in which the biological sex does not match the gender of the grave goods? No doubt, there are countless such examples in the archaeological record. Here, we will discuss only three: the Birka warrior, the 'Lovers of Modena', and the Suontaka Sword Burial.

BIRKA WARRIOR

First excavated in 1878, the grave that would become known as the Birka warrior has been a topic of conversation for over a century. Located in Birka, Sweden, the grave is situated on an elevated terrace above the town and near an ancient hillfort (Hedenstierna-Jonson, 2017, 854). Due to the location and the rich grave goods, this was believed to be the grave of an individual of high status and prominence in the past. The individual was buried with "a sword, an axe, a spear, armour-piercing arrows, a battle knife, two horses…[and] a full set of gaming pieces" (Hedenstierna-Jonson, 2017, 854). For nearly a century, the individual associated with this grave was believed to be male simply based on the accompanying grave goods. But, in the 1970s, osteological analysis was conducted and revealed the individual was most likely female. Recently, aDNA analysis was conducted and certified that this individual was indeed female (Hedenstierna-Jonson, 2017). A female individual buried in such a richly furnished grave and in a location of such prominence has prompted discussion of their gender in life. The Birka warrior grave is certainly not the first, and will not be the last, example of a female buried with male grave goods. Similar graves have been interpreted as women buried with family heirlooms or symbolic meaning, or that there was another male individual in the grave that is no longer present. Hedenstierna-Jonson suggests that these interpretations "likely neglected intersectional perspectives where social status of the individual was considered of greater importance than biological sex" (2017, 858). Perhaps this biologically female individual did not identify as female? Perhaps they did identify as female but simply preferred a 'masculine' way of life? Or perhaps they simply held an important role in their society and their peers wished to celebrate them in death as they did their male counterparts? We may never know for sure, but the case of the Birka warrior has encouraged archaeologists to discuss all possible explanations for this lavish female grave marked by male grave goods instead of relying on past interpretations.

'LOVERS OF MODENA'

Finding graves where two or more individuals were buried together is not unusual, and yet the case of one double burial from a war cemetery in Italy became popular in the media due to one feature of the grave. The individuals were buried holding hands. Dubbed the 'Lovers of Modena', the media popularized the idea that this was a romantic, heterosexual couple that was buried together. The skeletons were poorly preserved and thus osteological analysis was not possible. In 2019, enamel peptide analysis was conducting to determine the sex of the so-called

'lovers' and to identify the sex of other individuals within the cemetery as well (Lugli et al., 2019). The analysis showed that one individual in the cemetery who had been osteologically sexed as female due to the ox coxae and the skull was missexed "due to his age and the related low degree of sexualization of the dimorphic districts" (Lugli et al. 2019, 4). Here, enamel peptide analysis was able to clarify the sex of a younger individual. But, what about the 'lovers' for whom osteological analysis was not possible? To the surprise of the media, both individuals were identified as male (Lugli et al., 2019). The archaeologists have posited several explanations for these two males to be buried hand-in-hand in a known war cemetery. First, they suggest that being a war cemetery they could have been soldiers together or friends who died together in battle (Lugli et al., 2019, 5). Secondly, they may have been related and were buried together due to familial bond (Lugli et al., 2019, 5). Finally, they may have actually been in love, even though the time period forbade such relationships, and it would be unlikely someone would position their bodies in such a manner (Lugli et al., 2019, 5). Perhaps the person who buried them knew of their feelings and wanted to place them together in death? There are so many possible explanations for their positioning, and none should be ruled out. The initial assumption that this was a heterosexual couple simply based on their position in death is problematic though as it projects modern ideas on past societies without historical or archaeological evidence to support it.

SUONTAKA SWORD BURIAL

An early medieval grave from Suontaka Vesitorninmäki in Finland was revealed to contain an individual dressed in feminine attire – dress accessories and jewelry – but with two swords, one buried with the individual and one inhumed at a later date. Due to the feminine dress, the individual has been interpreted as female (Moilanen et al., 2022). Unfortunately, due to degradation of the remains, osteological sexing was not possible in this case. In order to determine the sex of the individual, aDNA was employed. Interestingly, the first round of results came back inconclusive, reading as neither male nor female. Upon running the samples again, the archaeologists found that the genetics of this individual most closely matched an XXY karyotype with 99.75% probability (Moilanen et al., 2022, 48–50). This karyotype is known as Klinefelter syndrome, in which an individual will physically present as male but may experience more typical feminine personality attributes due to lower testosterone levels (Moilanen et al., 2022, 50). Of course, many individuals may never know they have this syndrome and may live their lives entirely as male. But, this individual was buried in feminine garb suggesting the Suontaka individual may not have identified as male. The authors suggest that it is "possible that the individual was not simply a cross-dressing shaman or a person who was forced into a female outfit, but an individual who was accepted and allowed to express their gender identity freely, and had or attained a relatively high status in their society" (Moilanen et al., 2022, 53). The fact that a bronze sword was placed in the grave at a later date suggests the community may have continued to hold this individual in high regard. In this case, genetics was an enlightening clue for understanding the possible gender of this individual and how they were perceived by their community.

These are just a few of the numerous examples that exist where the sex of an individual and the gendering of their grave goods proved surprising compared to the expectations of either the archaeologists or the public. Biological sex does not define gender, but it can certainly assist understanding gender, particularly for societies that can no longer speak for themselves. Although, we must remember we cannot be one-hundred percent certain our interpretations

are accurate, and thus we should be careful with our interpretations of the gendered past.

CONCLUSION: MOVING FORWARD WITH AN OPEN MIND

aDNA alone cannot define gender in the archaeological record. In conjunction with grave goods, we might be able to infer gender and gain further understanding of that individual's role in their society. Both biological sex and gender are a spectrum. Interpreting past societies through the Western, heteronormative, and binary perspective that was typical of early 20th century archaeology is no longer acceptable. We must be extremely cautious to not approach the study of gender in the past through a presentist lens.

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