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European Bog Bodies: From the Iron Age peat bog
to the 21st century

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Abstract:

Well preserved bodies dating from the prehistoric era to the 19th century have been found across northwestern Europe; specifically in the peat bogs of Ireland, Great Britain and Denmark. These discoveries were especially prevalent in the late 19th and early 20th centuries when mass peat extraction was at its height. Many of these finds have been dated to the Iron Age and have previously been attributed to patterns of ritual violence. This paper focuses on three finds from the Iron Age: Graubelle man, Tollund man, and the Weerdinge couple.

This project intends to exhibit the types of information which have been and can be gleaned from the European bog bodies, and by doing so illustrate that Archaeologists have a responsibility to examine these individuals.

Introduction:

European bog bodies have garnered the attention of archaeologists, anthropologists, and forensic pathologists alike for years. This fascination is associated mainly with the level of preservation of these individuals. The discovery of these individuals is spread across northwestern Europe concentrating in Ireland, England, Scotland and Denmark, and they have been dated across history dated as early as 8000 BCE and as last as World War I (Killgrove 2016). This range of dates and varying levels of preservation have the potential to provide incredible scientific and cultural insight both historically and prehistorically.

One important aspect to address is the process and quality of preservation. The unique preservation associated with these individuals gives forensic scientists the ability to analyze and observe unique taphonomic processes associated with the bog. Forensic scientists also have the ability to study paleopathological conditions associated with the individuals during their life. Cultural information may also be gleaned from these individuals; particularly, mortuary practices. Both in the past (the era to which the individual is dated) and modern perceptions of death.

Since much of these individuals value stems from the preservation associated them, it is important that I now describe this process. According to Niels Lynnerup's definition bog bodies are another type of natural mummy:

"Mummies are human remains with preservation of non-bony tissue" (Lynnerup 2009: 441).

Unlike traditional methods of mummification, however, the preservation of bog bodies is achieved by submersion in a wet environment. Whereas, more typical modes of mummification are typically restricted to dry, arid environments (Egyptian mummies and Otzi the iceman for example). This is because the lack of moisture causes putrefaction to slow resulting in dehydration and preservation of soft tissue, rather than skeletonization.

In the case of the bog bodies the slowing of putrefaction is attributed mainly to the polysaccharide sphagnum. Sphagnum triggers a chemical reaction known as a Maillard reaction, which is also common in methods of food preparation (Lynnerup 2015: 1008), this type of reaction is described in more detail below.

"the diagenetic processes in the bog also rely on reactions involving a polysaccharide, sphagnum. Sphagnum is able to bind calcium and nitrogen which slows down the decaying process. Sphagnum also starts a process called the Maillard reaction: a reaction described by Maillard in 1912 as a complex suite of reactions between free aminogroups (amins, aminoacids, peptides and proteins) with reducing sugars." (Lynnerup 2015: 1007-1008)

While this process allows for the preservation of soft tissues in peat bogs; it also leads to the destruction of bony tissue. Because, during these chemical reactions bony tissues decalcify and demineralize according to Plicht et. al.:

"Bones delcalcify in raised bogs. They deform and many ultimately dissolve completely." (2003: 471).

This process is described in further detail by Lynnerup.

"The end result..., is that bone mineral is leached from the mineralized tissues, and conversely that mineral salts often containing iron, are probably absorbed into collagenous tissues such as the dermis, ligaments, tendons and fasciae." (2015: 1008).

Ironically it is this very loss of integrity in the bony tissue which allows for this marked preservation of soft tissues. One of the consequences of this decalcification is that when the waterlogged tissues are allowed to dry out the soft tissues often shrink. This has the potential to further deform the bones and can even cause uneven shrinkage. Which can result in extreme limb deformity leading to incorrect and unnecessary diagnoses of paleopathological conditions (Lynnerup 2015: 1008). Alternative preservational techniques have in some cases helped to reduce this shrinkage. The Borremose woman for example was preserved with formaldehyde and kept in a wet environment (Lynnerup 2015: 1008). The head of Tollund man and the body of Graubelle man were preserved with tannic oils in place of water (Lynnerup 2015: 1008).

Thankfully, as described in further detail later on in this section modern medical technology allows us to examine and analyze the bones without disrupting the integrity of the remains. It is this same medical imaging which has allowed researchers to more effectively analyze trauma. While also differentiating more effectively between peri- and post-mortem trauma patterns present on some of these individuals.

As in all anthropological forensic analyses it is very important for researchers to be very discriminating when examining taphonomic damage and trauma. This is especially important in the case of bog bodies due to the bone damage outlined above. Contrary to typical archaeological finds, the soft tissue holds a better record of trauma versus bony tissues:

“As the skin is very often preserved in bog bodies, trauma, in the form of penetrating lesions or cuts, may be seen as well as minor pathologies such as warts, for which we have no other paleopathological sources or finds.”(2015: 1009).

This dissociation between surface trauma and associated skeletal trauma in many cases has been the cause of much confusion about the violence associated with the deaths of these individual. An excellent example of this is the case of Graubelle man. Graubelle man was recovered from a bog near the village of Graubelle in Denmark, 1952. When he was initially recovered it was believed, based on initial forensic analysis,

that he received a blow to the head which resulted in cranial fracturing just prior to his death. This perceived injury, and, other evidence led to the development of the "over-kill" theory (Lynnerup 2015: 1010). According to Lynnerup the "over-kill" theory is described by the perceived order of events leading up to Graubelle Man's death. This order of events was perceived to be that of a ritual sacrifice during which the individual sustained a fracture to the tibia (to prevent escape), followed by a blow to the head, and was finally killed when his throat was cut; and was interred in the bog (Lynnerup 2015: 1010). In 2001 however, when Graubelle man underwent CT scanning it was determined that this cranial fracturing, was not the result of perimortem trauma as was initially postulated but rather occurred post-mortem and was actually the result of pressure from the bog which caused bilateral impressions so deep they resulted in fracturing. This pattern of fracturing is also exhibited by another bog body, known as Tollund man (see Fig. 1) (Lynnerup 2015: 1010).

These determinations and the availability of modern forensic technology has called for the re-examination of much of the trauma associated with the individuals. These contemporary investigations have led archaeologists to believe many of the surface lesions and trauma, as well as, skeletal trauma which was initially attributed to cause and manner of death; to

instead be the result of diagenetic processes associated with internment in a peat bog (Lynnerup 2015 pp. 1010).

Unfortunately since many of these individuals were buried not long after their initial discovery they are not available for secondary analysis as described by Van der Plicht et. al. in 2003:

"Many bog bodies did not survive their discovery for very long. Quite a few were reburied in local churchyards; others were thrown back into the bog or cut into pieces which were taken to different institutions." (Van der Plicht et. al. 2003 pp. 471).

Although this reinternment prevents further scientific analysis it is a valuable representation of cultural practices associated with death in the modern era. Especially when considering that many of these individuals are believed to have been social outcasts. Particularly those recovered which have been dated to the medieval era. Giles states the following:

"Several of the late medieval and historical bog bodies from Ireland have been interpreted as the burials of suicides, or those excluded for other reasons from burial in consecrated ground, such as unbaptized infants, or victims of a particular disease, or of murder, drowning or shipwreck elsewhere." (Giles 2009 pp. 77).

Therefore, their reburial in consecrated ground is unique, as it ascribes a different level of respect to the deceased that was provided in their original burial. In the original burial they were considered separate from the traditional society as a

whole, they were separated from their loved ones by some sort of social barrier both in life and death. But, then sometimes several thousand years after their death they are in a way reintroduced to society through their burial in consecrated ground. This interpretation of events ascribes a high level of respect for the dead in Northwestern Europe which could explain why Giles states in this same article that

“Some are perturbed and unnerved by the sight of these remains in a museum case and others argue that not only is their display disrespectful, but also their disturbance from the site of burial or internment.” (Giles 2009 pp.76).

Despite this negative opinion from some of the public however, we as scientists have an ethical responsibility to examine and analyze these remains. That said, many of these individuals specifically those associated with the Iron Age, which is my main period of interest would not have lived in the Christian tradition. Therefore, this insistence on reburial could also be considered a great affront to the dead; perhaps even more so than their use in museums and scientific research.

Continuing with the idea of cultural significance it is important to note that several of the bog bodies, including the three described below are believed to have been victims of ritual sacrifice, execution, or murder. This distinction is interesting because as previously stated many of the individuals interred in peat bogs are believed to have been outcasts of

normal social boundaries and were interred in peat bogs, because, they were believed to be appropriate liminal spaces for those who could not be buried in consecrated ground (Giles 2009 pp.77). Although the specificity of consecrated ground refers more to the medieval era than the Iron Age (which all of the individuals described here are attributed to), this idea of the peat bog as a liminal space for the dead suggests that there is a higher cultural significance to peat bogs in the past. Many archaeologists interpret this to mean that these individuals represent sacrifices to ensure the fertility of fields. Thus, the expansion of these ideas as well as the further investigation of cultural practices through the examination of bog bodies is where the archaeologist's responsibility lies.

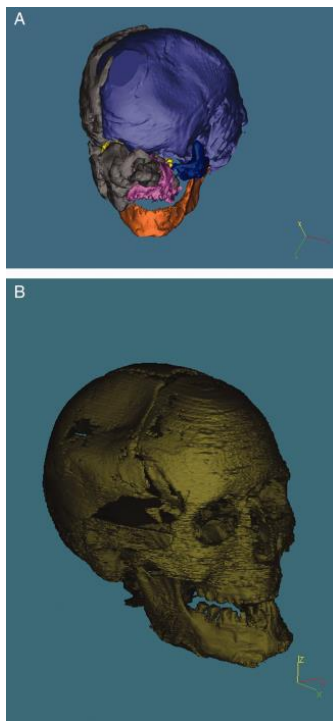


Figure 1: Skulls of Grauballe man (top) and Tollund man (bottom) (Lynnerup 2015: 1011 fig. 4)

Case Studies:



Figure 2: Map of the Location of 12 Bog Bodies (NOVA 2006)

- | | |
|-----------------------|-------------------------|
| 1. Gallagh Man | 7. Weerdinge Men |
| 2. Meenybraddan Woman | 8. Redswuhren Man |
| 3. Oldcroghan Man | 9. Osterby Man |
| 4. Lindow Man | 10. Windeby Girl |
| 5. Amcotts Moor Woman | 11. Tollund Man |
| 6. Yde Girl | 12. Graubelle Man |

The above map references the location of twelve Iron Age bog bodies. Although not all bog bodies are associated with the Iron Age, in fact, according to Walker and Peacock:

“There are several hundred documented finds of “bog bodies” from all over Europe, exhibiting a range of preservation states and spanning nearly all archaeological eras from Neolithic to Medieval” (2008 pp. 151)

A majority of which are concentrated in the areas depicted above. The twelve individuals depicted above include (respectively) Gallagh man, Meenybraddan woman, Oldcroghan man,

Lindow man, Amcotts Moor woman, Yde girl, Weerdinge men, Rendswuhren man, Osterby man, Windeby girl, Tollund man, and Graubelle man. In this section three bog bodies will be discussed; Graubelle man, Tollund man, and the Weerdinge couple all of which have been dated to the Iron Age. I chose to focus on these four individuals not for lack of interest, but rather, in the interest of time. It should also be noted that these four are some of the more notable representations of bog bodies.

Graubelle Man (fig. 3) was located in the Nebelgaard Bog just outside of the village of Graubelle in Denmark; he is said to have lived in the early Iron age. The body was discovered on the 26th of April 1952. He was discovered when the residents were cutting peat for fuel (Lobell and Patel 2010: 22). His age is approximated to be 30 years based upon analysis of his teeth and skeleton (Stodkilde-Jorgensen et. al. 2008: 530). Despite degradation of the skeleton described in the introduction which prevents proper surface examination due shrinkage and deformation; these issues can be circumvented by medical imaging such as X-rays and CT scanning (Lynnerup 2015: 1010). CT scanning allows analysis methods which were developed for dry bone to be applied to 3-dimensional imaging of the bog body's skeleton to determine sex and age (Lynnerup 2015: 1010, Lynnerup 2009). This type of imaging also allowed for the re-examination

of trauma patterns which in 1952 were attributed to perimortem injuries, but actually, represented post-mortem trauma and taphonomic patterns associated with internment in peat bogs.

Since his discovery modern investigations have allowed analyses of his stomach contents which evidence that his last meal consisted of porridge made from barley, grass, wheat, and herbs as well as some pork (Lobell and Patel 2010: 22, Stodkilde-Jorgensen et. a. 2008: 531). Between 12 and 24 hours after this meal he was strangled, his throat was slashed, and his body thrown into a Danish peat bog to be discovered about 2,000 years later; these determinations were based upon analysis of Graubelle man's intestines. It was difficult to determine what portion of the digestive tract was represented, but based upon the approximate length and diameter the remains represented Graubelle man's small intestine (Lobell and Patel 2010: 22; Stodkilde-Jorgensen et. al 2008: 531). This discovery is evidence for the level of scientific and historical information which can be gleaned from remains of this type.



Figure 3: Grauballe man (Lobell and Patel 2010: 22)

Tollund man (whose discovery predated that of Graubelle man by two years) (see fig. 4) has undergone similar analyses over the years. He was discovered in the Jutland Peninsula of Denmark. Examinations and analyses included CT scanning which exhibited similar cranial fracturing to Graubelle man (Lynnerup 2015: 1010). As previously stated the fracturing at least in the Graubelle man case was initially believed to have occurred at the time of death, when in reality it most likely occurred after death due to the pressure from being interred in the peat bog (Lynnerup 2015 pp. 1010). Tollund man was preserved with a sheepskin cap, a leather belt, and a two strand leather rope around his neck (the apparent cause of death) (Lobell and Patel 2010 pp. 24).



Figure 4: Tollund Man (Lobell and Patel 2010: 24)

The Weerdinge couple (fig. 5) upon their discovery in 1904 in the Netherlands were surrounded by mystery. Originally this fascination was based upon the 'intimate' position in which the

two individuals were found. Initially archaeologists assumed these individuals were a man and a woman. This presumption was based upon the pelvic structure of the larger individual; while the secondary individual's smaller stature led researchers to presume they were female. Following further analyses, it was later determined that they were both men. One hypothesis associated with their death is that they were executed together as one of the two's abdomen was cut open perimortem. And based upon this inference it has also been questioned as to whether or not their deaths are potential evidence for the claim by the Roman historian Tacitus that Germanic tribes executed homosexual couples (Lobell and Patel 2010 pp. 25). Unfortunately, the nature of their relationship cannot be determined based solely on the archaeological evidence.



Figure 5: Weerdinge Couple (Lobell and Patel 2010 pp. 25)

Methodology:

Using previous research this project aims to explore the potential associated with the study of Bog Bodies. This was accomplished by studying previous discoveries, modern reexaminations of these individuals, as well as taphonomic study. Examining taphonomic studies associated with Bog preservation is especially important when observing the importance of these individuals. Therefore, in the course of my research I examined what was preserved with the remains, the chemical composition of peat bogs, historical study of the bog bodies, as well as, how modern research has changed initial findings associated with these individuals.

Conclusion:

"Human skeletons have a universal fascination, arousing a wide variety of emotions from reverence to morbid curiosity to terror." (Bahn 1984 pp. 216).

The level of preservation associated with these individuals gives forensic archaeologists the ability to analyze and observe unique taphonomic processes associated with this type of preservation, paleopathological conditions associated with the individuals while they were living, as well as cultural practices. Especially mortuary practices both from the period to which they were dated and the era in which they were found. In Graubelle man's case, for example, researchers have been able

to analyze and differentiate traumatic and taphonomic patterns; and even study the contents of his last meal (Lobell and Patel 2010 pp.22; Stodkilde-Jorgensen et. al 2008 pp. 531). Tollund man was preserved with some of his clothing (a sheepskin cap and leather belt), as well as a leather cord which was his apparent cause of death (Lobell and Patel 2010 pp. 24). And finally, the Weerdinge couple whom were evidently executed together could represent evidence in support of the claim by the Roman historian Tacitus that Germanic tribes executed homosexual couples (Lobell and Patel 2010 pp. 25). Therefore, unclear patterns of trauma, the potential for more discoveries of this type and the unprecedented preservation of this type of artifact provide a fascinating window into the past.

It is my opinion that greater scientific analyses in the future would be largely warranted in the case of these individuals. The potential for examination of pathological conditions, particularly those associated with soft-tissue. Modern technologies also provide greater insight into patterns of trauma and taphonomy, something which historical analyses are sorely lacking. It is my hope to approach this project in the future with greater resources and the ability to perform intense analyses on these individuals.

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