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Title	Towards an archaeology of pain? Assessing the evidence from later prehistoric bog bodies
Authors	Chapman, Henry P.;Gearey, Benjamin R.
Publication date	2019-01-31
Original Citation	Chapman, H. P. and Gearey, B. R. (2019) 'Towards an archaeology of pain? Assessing the evidence from later prehistoric bog bodies', Oxford Journal of Archaeology, 38(2), pp. 1-14. doi:10.1111/ojoa.12165
Type of publication	Article (peer-reviewed)
Link to publisher's version	https://onlinelibrary.wiley.com/doi/abs/10.1111/ojoa.12165 - 10.1111/ojoa.12165
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Download date	2026-09-16 09:49:11
Item downloaded from	https://hdl.handle.net/10468/7521

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TOWARDS AN ARCHAEOLOGY OF PAIN?
ASSESSING THE EVIDENCE FROM LATER PREHISTORIC BOG BODIES

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This paper highlights the potential for what could be termed an 'archaeology of pain'. It reflects on the potential significance and role of the infliction, suffering, endurance and observation of pain by individuals in the past. It presents a case study of 'bog bodies', human remains recovered from wetland which, due to the anoxic, waterlogged conditions, preserve human flesh and associated evidence including injuries and cause of death. It is argued that evidence from pathological investigations of certain later prehistoric bodies provides hitherto neglected information concerning the embodied experience of pain, in particular its duration and intensity, which may be central to the interpretation of these events. This can be framed in terms of the experience of pain by the victims, but also the potential perception of pain and suffering by those inflicting this and potentially any observers of the final moments of these individuals.

INTRODUCTION

Human remains from wetlands (bog bodies), especially those from the later prehistoric period, have long been a subject of archaeological analysis and discussion (Giles 2009; van der Sanden 1996, 2013). The survival of soft tissue due to the exceptional levels of preservation that result from burial in the anoxic conditions of peatlands (Painter 1991), may permit a direct analysis of the appearance and health of such individuals, and in particular injuries and wounds suffered *peri mortem*. Several hundred bog bodies are known from north-western Europe, although many of the earlier discoveries have subsequently been lost, are poorly conserved or have not been investigated in detail (van der Sanden 1996; 2013).

The high levels of evidence for physical trauma associated with many bog bodies, including signs of apparently elaborate killing (Brothwell and Gill-Robinson 2002), has led to lengthy discussions of the archaeological significance of their death and deposition in wetland contexts.

Evidence of multiple injuries has been interpreted as indicating exceptionally brutal and potentially ritualised behaviour such as the 'triple-death' associated with Lindow Man (Cheshire, UK), or the brutality experienced by Dätgen Man (Schleswig Holstein, Germany). Such evidence has been used to suggest that many bodies result from human sacrifice (e.g. Parker Pearson 1986; Green 1998), although there has been considerable debate with other suggestions including murder or robberies/muggings (e.g. Connolly 1985), and punishment, as indicated by the writings of Cornelius Tacitus, writing in the first century AD (Tacitus, *Germania* 12; trans. Mattingly 1970, 111).

In this paper we consider how a more nuanced consideration of pain and associated suffering of individuals destined to become bog bodies could open up new perspectives on long archaeological running debates. Whilst several discussions acknowledge the 'brutality' of injury and death (e.g. Giles, 2014; Kelly 2012), the bodily experience of pain of the individuals has not been directly considered. More broadly, whilst there is of course a profusion of palaeopathological studies detailing mortality, health and disease in past societies, Kjellström (2010, 57) has observed that "…none of the often cited palaeopathology textbooks has the word *pain* in its index…" suggesting that the reason for this may be: "…the difficulties in dealing with such an individually perceived and culturally controlled issue." In addition, there is considerable philosophical debate concerning the nature and character of the human experience of pain (e.g. see Geniusas 2014). It has been argued that pain is an 'ontological item' which is open to understanding through phenomenological principles (Couceiro-Bueno 2009). Exploring this for the past, or its social and cultural expression and relevance in different contexts, is highly problematic. However, we will argue that the evidence from certain bog bodies allows us to consider the significance of the pain and suffering of these individuals in the moments leading up to their death. In particular, we suggest that this may have relevance in terms of understanding the 'performative' nature of certain killings (Giles 2014).

We begin with a summary of the current state of knowledge concerning the injuries and causes of death of later prehistoric bog bodies. We use these data to investigate the degree and duration of pain that may have been experienced by these people, drawing on pathological evidence. The paper concludes with a discussion of the potential significance of the role of the infliction and potential tolerance of pain in the interpretation of these killings. In particular, we suggest that the evidence allows us to think in terms of the duration of events that may have

lasted at the most for minutes or in certain cases, perhaps tens of seconds, a chronological focus that is rare for the archaeological record.

LATER PREHISTORIC BOG BODIES

THE FINAL MOMENTS – CAUSE OF DEATH

In order to interpret themes of pain and suffering it is crucial to understand which injuries occurred peri-mortem, compared with those experienced earlier in life, or post-mortem, through taphonomic processes. In recent years, the re-analysis of a number of bog bodies stored in museum collections (e.g. Gill-Robinson 2005; Asingh and Lynnerup 2007) has significantly refined understandings of the nature and timing of injuries suffered by the victims represented. For certain bodies, previously attributed injuries can now be discounted as the result of taphonomic processes relating to the burial environment. For example, it was thought until recently that the cause of death of Borremose III (also known as Borremose Woman 1948) was due to a heavy, violent blow to the head that crushed the face and tore off the scalp (e.g. Aldhouse Green 2001, 52-53). However, recent pathological investigations indicate that this was more likely to have occurred due to the pressure of the bog (Gill-Robinson 2005; Fischer 2012, 129-130). In other cases, recent forensic examination has highlighted *pseudopathologies*, previously identified injuries and causes of death found to be incorrect, post-mortem or unconfirmed. In the light of these re-examinations interpretations of the cause of death for many individuals have been challenged. The following section summarises the current evidence relating to the principal later prehistoric bog bodies where inflicted trauma has been either supported or dismissed.

Denmark

The relatively large number of bog bodies discovered in Denmark includes examples that have been studied in sufficient detail to provide indications of cause of death. From northern Denmark, of the three bodies discovered between 1946 and 1948 from Borre Fen, Borremose I (Borremose Man 1946) is the only one for which direct evidence has been found relating to his cause of death. Initial assessment indicated that the body displayed numerous injuries,

including crushing of the back of his head and a broken right thigh bone (Glob 1998, 90), although more recent assessment suggest that these are most likely to have been a result of the pressure of the burial environment (Fischer 2012, 125). However, a hemp rope made from three twisted strands was found around his neck tied in a slipknot that would have allowed it to tighten. The ends of the rope had been cut off and so, whilst it seems likely that this caused his death, it cannot be ascertained whether this was from hanging or strangulation.

The well-known examples of Elling Woman and Tollund Man were also found to have been killed by either hanging of strangulation, both found within the same bog to the west of Silkeborg. In the case of Elling Woman, discovered in 1938, a deep groove was identified around her neck and a leather halter of corresponding size was discovered at the site (Fischer 2012, 87-88). Re-examination of the body in 1978 revealed no other signs of violence (Gill-Robinson 2005, 63) and confirmed that other identified injuries were post-mortem. In her mid-20s or early-30s, she was killed and placed in the bog at around 355-205 cal. BC (van der Plicht *et al.* 2004, 482). Tollund Man, discovered twelve years later in 1950, revealed a similar pathology. Dating to broadly the same time as Elling Woman, at between 375-210 cal. BC (van der Plicht *et al*. 2004, 482-483), he was found with a braided leather cord with a running noose around his neck. A deep furrow around his neck except for the back where the head indicated that he had been hanged, even though x-rays revealed no significant spinal damage (Fischer 2012, 44-45). As with Elling Woman, no other evidence for peri-mortem trauma was discovered. Similar patterns of hanged or strangled victims from Denmark have also been identified from lesser-known bodies, such as the male body found with a rope around his neck in Lykkegård Fen in East Jutland.

A different type of pathology was identified with the discovery of Grauballe Man from a bog to the east of Silkeborg in 1952, most likely dating to between 150 cal. BC and cal. AD 30 (Heinemeier and Asingh 2007). Initial assessment of the body revealed three main injuries; a slit throat, a fractured left tibia and a fractured cranium. The broken left tibia and a fractured skull were initially considered as potentially being to prevent him escaping and to knock him unconscious respectively in advance of slitting his throat (Glob 1998, 48-49). However, a more recent examination (Gregersen *et al*. 2007) has shown that the cranial injury was not associated with his death since it happened after the bone had decalcified within the bog.

It was not possible to ascertain whether the damage to Grauballe Man's left leg occurred at the time of death or post-mortem due to movement within the bog, although it is unlikely that it occurred at the time of excavation. However, the slit throat was confirmed as a very deep cut made with a strong blade extending from ear to ear, cutting through both the epiglottis and pharynx, and would have severed both carotid arteries and jugular veins. The position of the cut indicated that an individual standing behind the victim had administered it. The interpretation of the wound was that "…it was carried out in life and brought about immediate unconsciousness and death in the course of a few minutes as a consequence of loss of blood from the severed carotid arteries to the head and the simultaneous suction of blood down into the respiratory system." (Gregersen *et al*. 2007, 254).

As with many of the other bog bodies from Denmark, the pathology of Huldremose Woman has been less straight-forward to ascertain. Originally discovered in 1879, her body was reburied but exhumed in 1904. Whilst this body is well-known for the associates clothing (Glob 1998, 79-80), it was not until 1986 that forensic examination of the body finally took place (Brothwell *et al*. 1990). The primary injury was the amputation of the lower left arm, and it was initially suggested that she might have died from blood loss associated with this injury. Whilst the lower part of her arm was discovered, the elbow part was not, indicating that there had been two amputations. However, it is far from certain that this was the cause of Huldremose Woman's death, with other suggestions including strangulation with a cord that was found wrapped around her hair but also around her neck (Fischer 2012, 116-117).

Germany

Within Germany, a relatively large number of bog bodies have been found within the Schleswig-Holstein region. Of the three discovered in See Moor bog near the town of Damendorf, in 1900, 1934 and 1947, only the first survives. Damendorf I (also known as Damendorf Man), dated to cal. AD 135-335 (van der Plicht *et al*. 2004, 485), was originally believed to have experienced between fifteen and twenty stab wounds. One of these, in the area of the heart, was confirmed during recent re-examination of the body (Gebühr 2002) although other cuts could not be confirmed as having occurred peri-mortem, with some skin tears identified as being due to desiccation (Gill-Robinson 2005, 177). It is possible that a much less dramatic death can be concluded, in the form of a single stab to the heart.

In contrast, the evidence from Dätgen Man, discovered in 1959, revealed a more complex series of events. Dating to cal. AD 135-385 (van der Plicht *et al.* 2004, 486), the initial find was of a decapitated male body with additional injuries to the chest, right hip, ribs and back, in addition to fractures of the right leg and both sides of the pelvis, and missing genitalia. Six months after this discovery, the remains of a decapitated head displaying a Suebian knot hairstyle and facial hair were found approximately 3m from the initial discovery and was assumed to be associated. More recent forensic examination has confirmed the existence of two stab wounds to the chest, one of which penetrated into the heart, providing a most likely cause of death, although other cut marks could not be confirmed (Gill-Robinson 2005, 263). Poor preservation of the cervical vertebrae meant that any cuts relating to the act of decapitation could not be identified, and the fractured left humerus was found to have partially healed and therefore could not have been a peri-mortem. However, whilst parts of the scrotal sack were present, the penis had been removed using a sharp blade, either at the time of death or shortly afterwards. Hence, whilst some of the numerous injuries to Dätgen Man could be dismissed, the victim was stabbed twice (one of which reached the heart), emasculated and (probably) decapitated. Intuitively, it seems likely that he was stabbed prior to decapitation, but the relative timing of emasculation could not be determined.

Stabbing as a cause of death was also identified in the case of Kayhausen Boy. Found in 1922, this individual was originally thought to have been between eight and fourteen years old when he was killed although more recent examinations suggest that he was around six and a half (Pieper 2003, 111). Loosely dated to between the fourth and second centuries BC (van der Plicht *et al.* 2004, 483-484), Kayhausen Boy was stabbed repeatedly, presumably after having been elaborately bound (van der Sanden 1996, 161). The stabbing consisted of three parallel wounds to the neck (Gill-Robinson 2005, 68-69).

Ireland

The discovery of two later prehistoric bog bodies within three months of one another in 2003 has provided exceptional evidence for peri-mortem trauma. Clonycavan Man, from County Meath, dating to 392-201BC was killed by "…a series of blows to his head and chest, from a heavy, edged weapon, probably an axe" in addition to a long cut to his abdomen, which might

indicate disembowelment (Kelly 2012, 235-236). The lower part of the body was not preserved, presumably removed by peat-cutting equipment. The second body, Old Croghan Man from County Offaly dating to 362-175 BC, suffered different injuries: only the upper thorax and arms survive and so other potential injuries remain unknown. It appears that he was killed by a stab wound to the chest, but his left arm was also cut, indicating a possible defence wound. Old Croghan Man was decapitated and his thorax was severed from his abdomen (Kelly 2012, 239). In addition to these injuries, both Old Croghan Man and Clonycavan Man also had their nipples partially cut, and the former had incisions through his biceps through which withies had been passed, possibly some form of spancel (a hobble designed to prevent movement of animals). It is not clear whether these mutilations took place before or after death.

The Netherlands

Of the two Weerdinge bodies discovered in Drenthe in 1904, only one was sufficiently well preserved to provide evidence of his cause of death, and initially the poor preservation meant that the two men were considered to be a man and a woman (Glob 1998, 110). The better preserved individual had a large cut across the left side of his chest through which his intestines had been pulled (van der Sanden 1996, 161). Whilst further evidence from the Weerdinge bodies is limited due to preservation, if undertaken prior to death, this would indicate an extremely painful method of killing. However, this cannot be confirmed and it is most likely that these individuals were killed by stabs to the chest. The bodies have been dated to 40 cal. BC – cal. AD 50 (van der Plicht *et al*. 2004, 487).

The discovery of Yde Girl from within a small isolated bog in Drenthe in 1897 provides a stronger indication of cause of death. Dating to between 40 cal. BC and cal. AD 50 (van der Plicht 2004, 486), this individual was strangled with a woollen band wrapped three times around her neck with a sliding knot (van der Sanden 1996, 155). This left a deep furrow in Yde Girl's skin around her neck, and it is likely that the knot was tightened from a position beneath her left ear (*ibid*., 156-157). Yde Girl was also been stabbed near her left clavicle (*ibid*., 161), although it is not known if this would have extended downwards to her heart.

United Kingdom

Whilst there have been numerous bog bodies discovered in the United Kingdom, only one was sufficiently preserved and studied to provide clear evidence of cause of death. Lindow II (or Lindow Man, dating probably to the first century AD) was discovered on Lindow Moss in Cheshire, the individual suffered a series of injuries (Gowlett *et al.* 1989, *cf*. van de Plicht *et al.* 2004, 472-3). Although a stab wound to the chest could not be confirmed due to preservation, forensic examination revealed multiple methods of killing (West 1986). it is likely that this commenced with two deep wounds to the crown of the head, probably administered by an axe whilst the victim was in a kneeling position. These wounds would eventually have been fatal, but swelling around them indicated that they did not kill the individual instantly, but would certainly have rendered him immediately unconscious.

Examination of Lindow II's neck revealed a tight, thin ligature interpreted as a garrotte, and a laceration on the right side of the neck. The latter had been administered using a sharp edged blade, cut through the soft tissue and severed the superior border of the right lamina of the thyroid cartilage. The position of this wound was regarded as in keeping with an intention to sever the jugular vein. It was argued that, if this were administered at the same time as tightening the ligature as a garrotte, this would have accentuated blood flow. Assuming that the carotid arteries were not shut off and were thus able to supply the head with blood, the garrotte would have blocked the left jugular forcing all of the blood supply from the head to flow through the cut vein (West 1986, 79). It seems that the garrotte was further tightened, resulting in the breaking of Lindow II's neck which would most certainly have resulted in his death, although he would have been unconscious and possibly dead by this stage. Other apparent injuries were identified, including a fractured posterior rib potentially from a blow to the back, perhaps forcing the victim face-down into the bog. A possible stab wound to the right side of his chest could not be confirmed.

CONSCIOUSNESS AS A PROXY FOR PAIN

Despite the rich evidence from bog bodies, it is clear from recent research that many of the identified injuries are more likely to be pre- or post-mortem than to have been responsible for the deaths of these individuals. In some cases, the lack of confirmed evidence has reduced the number of individuals that were clearly deliberately killed. However this new research provides clarification of likely causes of death. For the bodies where the evidence is unequivocal, pain

and, ultimately, death was inflicted through a range of causes: decapitation, disembowelling, stabbing, hanging, strangulation, slit-throats and blows to the head, in addition to mutilations, such as cutting of the nipples, arms or genitals. For individuals who suffered multiple injuries, it is not always possible to determine the precise order of events.

However, each of the separate injuries can be examined in relation to the levels of pain that would have been experienced. Whilst extreme pain can itself result in unconsciousness (McQuillen and McQuillen 1994), and precise definitions relating to the experience of pain within different stages of consciousness vary (e.g. McQuillen 1991), there is a relationship between the direct experience of pain and consciousness. The intensity of physical pain experienced cannot of course be measured directly, whilst the victims would possibly have experienced psychological pain, both in terms of their final moments and probably in the time before this, especially if their fate was known in advance. However, we may consider pain in relation to the duration that it was experienced. In other words, the time between the infliction of an injury and the subsequent loss of consciousness provides a quantitative proxy indicator for considering pain.

Cranial trauma

Both Lindow II and Clonycavan Man suffered blows to the head that would have resulted in immediate loss of consciousness and, ultimately, death (West 1986, 78). Head trauma can have differing reasons for a loss of consciousness depending on the nature of the strike (Marshall *et al*. 1990; Ghajar 2000). In the case of open head injuries, as with Lindow II, direct impact on the brain normally causes immediate loss of consciousness. Modern examples include bullet wounds, penetration through the eyes and direct penetration of the skull. Closed head injuries and deceleration injuries can still result in traumatic brain injury due to the differential movement of the brain and skull, leading to both direct damage to the brain and internal swelling leading to pressure on the brain. In these cases, the rapidity of loss of consciousness can vary from mild concussion to immediate loss of consciousness depending on the nature of the injury. A blow to the head can also result in damage to the spinal cord which, in extreme cases, can cause immediate brain death.

Perhaps due to the nature of the evidence, all confirmed cranial injuries from bog bodies resulted in penetrative damage to the skull and it is likely that these injuries resulted in an

immediate loss of consciousness even if, as in the case of Lindow II, death from such injuries could have taken a number of hours.

Hanging and strangulation

Examples including Elling Woman, Tollund Man, Yde Girl and Borremose I present evidence of either hanging or strangulation. This type of asphyxia can be defined as the application of external pressure on the neck resulting in the closure of blood vessels and/or air passages. There are three principal types of strangulation categorised on the basis of the source of the pressure being applied. The first is *hanging* whereby a rope or cord (or similar object) constricts the neck due to the gravitational weight of the body. In instances of hanging, death can be caused by asphyxia or, in cases where hanging includes a rapid fall from a height, by a fracture dislocation of the upper cervical vertebrae. Such a fracture of the C1-C2 vertebrae would sever the spinal cord severing functions such as breathing and heart rate, which are controlled by nerves at that level. The second type of strangulation is *ligature strangulation*, where the neck is constricted by a rope (or similar object) caused by a force other than body weight. This form of strangulation includes garrotting where an object is inserted into the loop around the neck that is tightened by twisting. The final type of strangulation is *manual strangulation* which implies pressure on the neck by hands, forearms or other limbs (Sauvageau 2014, 23-24).

The speed at which unconsciousness and death occurs varies. When hanging is augmented by a rapid drop resulting in the fracture of the upper cervical vertebrae, death can be instantaneous (Rothschild and Schneider 1999, 60). However, other types of hanging can take longer. Reports from filmed examples of suicidal hangings have shown a loss of consciousness at 13 seconds, convulsions from 15 seconds and a cessation of respiration after two minutes (Sauvageau and Racette 2007), with a second example resulting in death in two minutes and 43 seconds (Yamasaki *et al*. 2007). The process of death takes different stages, although these can vary depending on specific circumstances. The interruption of blood flow to the brain by occluding arteries and veins, which takes considerably less pressure than occluding the trachea, will result in a loss of oxygen to the brain. This begins with a shortness of breath, followed by a loss of consciousness, gasping and loss of bowel and bladder control. Finally, respiration stops, with irreversible brain damage, although there might be continued cardiac activity and muscle movement for a number of minutes (Gilbert *et al*. 2008). Ultimately, death from the occlusion of arteries in the neck will result in between two and three minutes, with complete circulatory

collapse between four and eight and a half minutes (Boghossian *et al.* 2010), although loss of consciousness will typically result in less than 15 seconds.

Slitting of the throat and decapitation

Grauballe Man and Lindow II both displayed evidence that their throats had been slit. In the case of Grauballe Man, the cut was deep and would have severed both carotid arteries and jugular veins, in addition to cutting the epiglottis and pharynx. In contrast, only one of Lindow II's jugular veins appears to have been cut. The cause of death from such injuries is dependent on what is severed. The severing of principal arteries and veins will result in death through blood loss and, in extreme cases, death can occur in a matter of minutes. The human body has approximately five litres of blood, and a loss of two litres will result in symptoms including dizziness and confusion, with unconsciousness following greater blood-loss. Whilst death will occur through exsanguination, the rapid loss of consciousness is normally associated with the drop in blood pressure (Peitzman *et al*. 1995).

More directly, the severing of one or both of the carotid arteries, which supply 90 percent of oxygenated blood to the brain, will result in death in a matter of minutes with a more rapid loss of consciousness similar to that from blocking these arteries. Unconsciousness will normally result within ten seconds if motionless, but this will be accelerated if the victim is moving or struggling.

The precise time before loss of consciousness and death from decapitation is not clearly understood, although anecdotal evidence indicates that unconsciousness might not be immediate. At a theoretical level, death will occur due to a range of different factors, some of which will be more rapid than others. Unconsciousness will occur from a lack of oxygenated blood to the head by the severing of arteries, within perhaps four seconds. The severing of the spinal column might result in a more rapid loss of consciousness. In all cases where the carotid artery is severed, air can also enter the brain causing a stroke. Ultimately, decapitation is likely to cause either immediate loss of consciousness, or within at most a few seconds, although the nature of any consciousness is of course unknown.

Stabbing

It is not possible to generalise about the effect of stab wounds. In the cases of Damendorf I and Dätgen Man, stabbing penetrated the heart (which might also have been the case for Kayhausen Boy, Yde Girl and Oldcroghan Man). Puncture wounds to the heart can vary in the speed at which they result in unconsciousness and death, dependent on which part of the heart is injured, from severing arteries through to stopping the heart. If the wound were sufficient to stop the heart, then consciousness would be lost within four seconds if the individual were standing. Otherwise, the loss of consciousness will be determined by other factors, such as those experienced for severed arteries.

CONSCIOUSNESS AND PAIN

On physiological grounds, the range of injuries evidenced by the bog bodies discussed above exhibiting clear signs of inflicted trauma can be considered in relation to the speed at which the individuals would have lost consciousness, even if the time before death was longer. It is possible that unconsciousness occurred faster, such as through fainting, but the pathologies do provide some understanding of the experience of pain. A list of bog bodies and the potential time required before loss of consciousness in relation to each of the potentially fatal injuries is provided in Table 1.

Direct cranial trauma can cause an immediate loss of consciousness. The presence of numerous blows on both Lindow II and Clonycavan Man indicate a determined effort to knock the individual unconsciousness (and perhaps even to kill). In both cases, the relative timing of such traumas in the sequence of other injuries is uncertain. Impacts on the neck include non-invasive (hanging/strangling) and invasive (slit throat or decapitation), will result in loss of consciousness through the reduction of blood oxygen to the brain. Since the carotid artery supplies about 90 percent of oxygenated blood to the brain, the total occlusion or cutting of both will result in a loss of consciousness in around 10 to 20 seconds (and death in two to four minutes). Severing of all arteries, as with decapitation, will result in a loss of consciousness within four seconds. Decapitation and snapping of the C1-C2 vertebrae will also sever the spinal cord and the nerves that sustain breathing and heart-rate, potentially resulting in a more rapid loss of consciousness. For examples where the throat has been slit, blood-loss will also be a factor with varying rapidity depending on what is cut. In the case of Lindow II, if he had been

conscious when he had just the one jugular vein cut, the reduction in blood pressure (hemorrhagic or hypovolaemic shock – Williams 1968; Nolan and Pullinger 2014) would have resulted in unconsciousness within less than a minute. For Grauballe Man, loss of consciousness would have been more rapid, within approximately 10 seconds.

For victims stabbed in the heart, such as Damendorf I and Dätgen Man (and possibly Yde Girl) loss of consciousness would have been within perhaps four seconds and hence any experience of pain relatively brief. Dätgen Man suffered two stabs to the chest, only one of which reached the heart, which might indicate a misplaced first blow. This would have extended the victims pain, but it is not known whether decapitation occurred before or after this. For Damendorf I, the unconfirmed evidence of multiple stab wounds might indicate extended pain although this is unclear.

For individuals displaying evidence of multiple injuries where each would have resulted in death, such as Lindow II and Oldcroghan Man, unconsciousness might also have been relatively quick, depending on the sequence of events. If Lindow II were struck on the head first, then he would have been unconscious throughout the subsequent events leading to his death. However, if he was garrotted and had his jugular severed first, it is possible he remained conscious for up to a minute, or until the garrotte was tightened resulting in the broken neck. For Oldcroghan Man, the stab to the chest could have resulted in a very rapid loss of consciousness.

This does not account for other, non-fatal injuries suffered by these individuals. The infliction of ‘extreme’ pain has been suggested for both Clonycavan Man and Oldcroghan Man. Both may have had their nipples partially cut off and Oldcroghan Man had withies passed through cuts in his arms, perhaps a form of spancel (used to hobble cattle during milking). It is possible these wounds were made following loss of consciousness, although the cut marks on one of Oldcroghan Man’s arms has been interpreted as indicating an attempt to protect himself. This might suggest a degree of awareness and a desire to prevent it. Depending on the sequence, we might equally interpret a rapid loss of consciousness with minimal pain or protracted processes of pain. Each of these scenarios arguably has implications for how we might interpret these killings.

THE INFLICTION AND ENDURANCE OF ANTE MORTEM PAIN AND SUFFERING

The evidence presented above implies that most of the individuals in question, suffered physical pain for no more than 15 seconds before losing consciousness. Whilst the experience of pain cannot of course be directly measured in terms of intensity, it would appear that in most cases, infliction of pain was not stretched out beyond a relatively short period of time. Different interpretations of this may be suggested: Firstly, in the case of a mugging or robbery, clearly it would be in the interests of the perpetrators that consciousness of the victim was extinguished as quickly as possible. Alternatively, given the alleged 'ritual' nature of certain of these killings, the following observations concerning the suffering and infliction of pain can be proposed.

A rapid loss of consciousness leading to death both shortens the suffering of the victim, but also equates to a more rapid conclusion (or culmination?) to the event in question. Nevertheless, it can be argued that in most cases, extended infliction and conversely tolerance of pain, was not a deliberate feature of the process. The knowledge of a 'quick death' might have been regarded as offering some solace to the victim as well as to any audience or observers of the event. This of course does not account for events over a longer time scale, especially in the case of the psychological pain suffered by individuals who may have known their fate in advance, as has been argued for Lindow II and by implication the Old Croghan and Clonycavan bodies.

Even for those individuals who display evidence for extended pain which may be equated with 'torture', such as Oldcroghan Man, Clonycavan Man and Dätgen Man, different readings of the precise sequence of events associated with their deaths provide subtly varied interpretations in terms of a 'ritualised' killing as has been argued for the latter examples (Kelly, 2012). An interpretation that proposes the removal of nipples prior to loss of consciousness, might suggest that the resulting display of the resulting extreme but non-fatal pain, was an integral component of the event. It is difficult to envisage that this circumstance would not have involved a significant display of suffering on the part of the victim, not to mention the visual spectacle of quantities of blood. Likewise, the possible insertion of a spancel (to restrain or manoeuvre the victim into position?) into Oldcroghan man's upper arms during consciousness would have caused extreme pain. If the interpretation of these killings as 'deposed kings' is accepted then the public display or performance of pain brings a different perspective to the final moments of these people. If the removal of nipples and spancel insertion happened following a loss of

consciousness again the killings take on a different character, at least as regards the pain endured by the victims.

FURTHER EVIDENCE FOR THE 'MANAGEMENT' OF PAIN?

For the majority of examples, the evidence is far less equivocal but suggest the likelihood that the modes of killing were designed to minimise rather than maximise the duration of pain suffered prior to loss of consciousness. There is also potential evidence of deliberate attempts to minimise pain and suffering in the form of the preserved stomach contents of some bog bodies. The initial investigations by Helbæk (1958) of the stomach contents of Grauballe Man revealed that he had consumed large quantities of a fungus associated with cereals; the sclerotia or spore capsules of *Claviceps purpurea* (ergot). If this was the case, it would have meant that he would have been experiencing hallucinations, convulsions and burning sensations in his mouth and extremities, perhaps even in a coma or dead when his throat was slit (van der Sanden 1996, 118). More recently, analyses have drawn into question whether the quantities discovered were sufficient to have produced "…significant anaesthetic or hallucinatory effects…" (Harild *et al.* 2007, 176). It is also possible that the identification of an extremely small quantity of mistletoe pollen identified within the gut of Lindow II (Scaife 1986, 131-132) is indicative of the use of the plant to provide some narcotic effect.

Whilst the evidence is equivocal, it opens the possibility that psychoactive substances could have been taken by individuals in ways that would leave little trace archaeologically. The presence of other substances which might have helped 'manage' pain have been found elsewhere, such as from Hengistbury Head, Dorset, where the relaxant chamomile and opium poppy seeds were found, potentially used within prehistoric medicine (Redfern 2009, 445). It is possible that knowledge of the properties of such plants will have played a role in acts such as human sacrifice (see also Guerra-Doce 2014; Long et al. 1999).

AN ARCHAEOLOGY OF PAIN?

This analysis has argued pain may be approached indirectly, through the exploration of the relationship between injuries and loss of consciousness displayed by certain later prehistoric bog bodies. This of course focuses on pain within a very narrow archaeological context and one

which is only possible due to the exceptional preservation of these human remains. Whilst the infliction of these injuries may have been a visual spectacle to any observers, perhaps indicating ceremonial or ritualised contexts, the experience of physical suffering by the victim appears to have been relatively short-lived in most instances. Where this was the case, the embodied experience of pain in terms of its duration and intensity provides clues to the intentionality of the perpetrators as 'performers'. In contrast with previous interpretations, the analysis of injuries provides strong indications that the experience of pain might have been 'managed' and controlled to minimise suffering of the individuals in question. This might be linked to Giles (2014, 547) observation that the 'brutal' deaths signified by later Iron Age bog bodies: "...may strike us as callous, but it seems likely they were framed within a different ontological understanding of violence and the body…" Whilst it would not be appropriate to assume that all bog bodies necessarily represent the same traditions or intentions, the evidence for apparently controlled infliction of pain is striking. Another important point in this context has been raised by Fredengren (2018), arguing that certain individuals preserved as bog bodies might be understood as their having been exposed to 'slow violence' (for example, through the lack of access to sufficient nutrition) in the months or even years before their deaths. This draws important attention to the need for further reflection on the role of pain and suffering in different contexts in prehistory.

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Body	**Injury**	**Potential time until loss of consciousness**
Borremose I	Strangulation/hanging	< 15 seconds
Elling Woman	Strangulation/hanging	< 15 seconds
Grauballe Man	Slit throat	< 10 seconds
Tollund Man	Strangulation/hanging	< 15 seconds
Damendorf Man	Stab to the heart	< 4 seconds
Dätgen Man	Stab to the heart	< 4 seconds
	Decapitation	Immediate (or near immediate)
Clonycavan Man	Cranial injuries	Immediate
Oldcroghan Man	Stab wound to chest (if it reached the heart)	< 4 seconds
	Decapitation	Immediate (or near immediate)
Yde Girl	Strangulation	< 15 seconds
	Stab wound in by clavicle (if it reached the heart)	< 4 seconds
Lindow II	Severed jugular vein	< 1 minute (due to reduction of blood pressure)
	Cranial injuries	Immediate

Table 1. *Relating injuries of bog bodies to likely time before loss of consciousness (this list only includes bodies where sufficient information exists regarding cause of death). There are numerous factors that can alter these timings, but these are provided as indicative.*