Retrieving, Curating and Depositing Skulls at Pitted Ware Culture Sites

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At many Middle Neolithic sites in south-central Scandinavia associated with the hunter-gatherer complex known as the Pitted Ware culture, the skulls of humans and animals seem to have been treated differently from other skeletal elements. This is evident, for example, in inhumation graves lacking crania or entire skulls as well as numerous finds of cranial and mandibular fragments scattered in cultural layers or deposited in hearths and pits. Despite parallels in overall treatment and find contexts, the selective handling of human skulls has generally been regarded as a mortuary practice and thus qualitatively different from the handling of animal skulls. Focusing primarily on the head bones themselves and relating their treatment to the wider use of skeletal remains allows us to consider a more complex system of retrieving, modifying, curating and depositing crania and mandibles. Drawing on the overlapping general treatment of human and animal remains, it is suggested that head bones from both humans and animals were efficacious objects that could be used in depositional acts.

Keywords: acephalous, neurocranium, third millennium, human-animal relations

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Introduction

The purpose of this paper is to investigate the apparently selective treatment afforded to skulls at Pitted Ware culture (PWC) sites in south-central Scandinavia. This selective treatment is visible in the form of inhumation graves lacking heads and in crania, mandibles or cranial fragments deposited in archaeological features or scattered in the cultural layers. A similar preoccupation with animal skulls is also noticeable at certain sites where crania or mandibles from different animals have been found placed in human graves as well as in single or multiple deposits of a more ‘zoocentric’ character, where attention seems directed towards the animal remains irrespective of whether human remains are also present.

Today the skull is often a symbol for danger or death, and skulls are often viewed as frightening and disturbing. But beneath this superficial view lie a plurality of sometimes conflicting attitudes towards skulls, including, for example, their widespread use in tattoos, jewellery and clothing patterns. In some areas of early modern Europe skulls of deceased relatives were even kept as memento mori in special boxes (Coughlin 2013). Human remains are obviously not universally repugnant to the living, and skulls also have a tangible materiality and physical presence that is not reducible to symbolism. By their distinctive shape, they are readily identifiable as once living beings, as well as being separate from them. The empty eye sockets of skulls endow them with a stare that draws in the gaze of the observer, and any remaining teeth help to form a constant grinning expression. Crossculturally, skulls as well as other bone elements often demand certain actions and are considered able to do things and affect their surroundings (see e.g. Krmpotich et al. 2010).

Indeed, selective treatment of human heads or head bones is a well-documented phenomenon transcending both space and time, although the specifics vary considerably. Restricting ourselves to the Stone Age, we can point to the modified human calvaria (‘skull cups’) of the Upper Paleolithic (Bello et al. 2011), Mesolithic ‘skull nests’ in Ofnet, Germany (Orschiedt 2005), the crania mounted on stakes at Mesolithic Kanaljorden in Motala (Hallgren 2011; Gummesson et al. 2018), and the headless graves, plastered skulls, and depictions of severed heads and headless bodies from the Neolithic Mediterranean and the Near East (Talalay 2004; Bonogofsky 2006; Croucher 2006, 2012:96–99).

Human skull removal has been seen as a way of de-personalising and transforming certain individuals in order to make them a part of the collective memory of a society (Talalay 2004). In a similar vein, Ian Kuijt (2008) interprets the plastered skulls from the Near East as ritual heirlooms used for creating intergenerational memories. The conventional view of ances-

tor worship is one where the curating of human remains is understood as a means of establishing connections between the living and the dead (Croucher 2012:143). Other interpretations of the function of skulls include them being stand-ins for the totality of the body, apotropaic devices, efficacious ‘catheted objects’ or potent offerings to supernatural powers (Hill 2003, 2006). In her study of skulls found on Moche sites in Peru, Erica Hill suggests that human bodies were partitioned into discrete portions with varying efficacy, the head being the most efficacious, that could be given as sacrificial offerings to the ancestors (Hill 2003). Skulls might also be used as memorial objects and as tools to be employed during divination rituals (Bonney & Clegg 2011). One common explanation for why heads are acquired and curated in headhunting societies are that they aid and sustain the regeneration of both people and crops (Hutton 1928; Needham 1976; Hoskins 1996).

Animal crania, particularly from cattle, found in ditches of Neolithic causewayed enclosures in Great Britain have interpreted as ‘special deposits’ (e.g. Whittle et al. 1999:368; Pollard 2001). A regularly occurring theme in the study of hunter-gatherer societies is the structured and respectful treatment of prey animals both in connection to the kill itself and to the butchering and disposal of skeletal remains (e.g. Bird-David 1992; Ingold 2000:67; Hill 2013; Willerslev et al. 2015). There are numerous archaeological finds as well as ethnographic accounts suggesting that animals could affect the lives of humans through their remains, most prominently through their skulls (Masuda et al. 2006; Germonpré & Hämäläinen 2007; McNiven 2010, 2013; Losey et al. 2013; Willerslev 2013; Bansgaard et al. 2019). The heads or the defleshed crania of the primary prey or other important animals are frequently given the greatest concern and deposited in designated areas shielded from dogs or other scavengers (Willerslev 2013; McNiven 2013). Care may be taken to either avoid or purposely redirect the gaze of the dead animal, and there are documented practices of offering them food and drink (Jochelson 1926:147; Hill 2013:125). The jaws of killed bears are sometimes wired shut in order to prevent the animal from avenging its death (Willerslev 2013:51).

Skull removal and deposition is related to broader practices of secondary manipulation of bodies and the dispersal of skeletal remains. The distribution of disarticulated human remains in the landscape has been compared to the circulation of special items in ethnographically studied gift economies such as the Melanesian Kula ring, and the circulation of certain ‘token’ remains has been envisioned as a transactional flow serving to create and mediate social relationships between humans, supernatural beings and the landscape through circulation and deposition (Thomas 2000:662; Chapman 2000:4–7). This ties in to a reconsideration of personhood as a

characteristic of indivisible, bounded human bodies, deeply rooted in western philosophical tradition (Brück 2004; Fowler 2004). Such reconsiderations see personhood as ‘distributed’, not residing within the confines of the individual body, but made up of the networks of various substances and relationships that a person accumulated and entered into during their life course (Bloch 1982:225; Strathern 1988:13, 1996:526). The dead might after some time, or through specific interventions, become non-persons (Fahlander 2018:59). A severed head, a defleshed cranium or a detached mandible is not necessarily to be equated with an individual person.

The treatment of the human body as a self-evident, bounded and ‘natural’ entity has globally been challenged by perspectives that treat the body as a certain type of material culture (Sofaer 2006). The skeleton changes its physical character and composition throughout life depending on a host of culturally prescribed activities and dietary practices (Sofaer 2006:77). Indeed, both archaeological and anthropological examples show that detached heads are often treated as a type of material culture rather than as individuals (e.g. Bonogofsky 2011:4). The concepts of ‘headedness’ and ‘headlessness’, defined as a particular tension surrounding heads identified at Neolithic Çatalhöyük might be interesting to consider (see Meskell 2008). The concepts in question have recently been taken up by Marianne Hem Eriksen (2020) and applied to the practice of depositing skulls and skull fragments in built environments in the Scandinavian Iron Age. Treating these selected bone elements as ‘head-objects’, as Eriksen (2020:104) suggests, places them on an ontological level different from things, humans and animals as well as in a precarious position between the living and the dead. Such considerations relate to discussions of the cadaver in its entirety as an ‘abject’, occupying a position between a social subject and an object, not quite being a person, but also not a not-person (Nilsson Stutz 2003:95–97). The precarious position of detached heads is further in congruence with Ian Armit’s (2012:61) review of ethnographic accounts of headhunting societies where he posits heads as liminal objects, active between the worlds of the living and the dead and regularly employed during rites of passage (see also Armit 2017:169). Among ethnographically studied headhunters, heads are for instance considered able to bring benefits to the community, but they also need to be continuously fed, kept warm and are ultimately potentially dangerous to the living so that only elderly men who are ‘weary of life’ dare touch them (Metcalf 1996:251).

The consideration of skulls as head-objects crosscutting the human-animal boundary acknowledges the fact that the skull is a homologous biological structure that humans share with other animals (Fuentes 2006). Recent theoretical perspectives focus on relationships between humans and animals rather than any categorical difference between them, and scholars

in a wide range of disciplines now attempt to address the relational webs of humans and non-humans that make up lived experience today as well as in the past (e.g. Ingold 2000:187; Barad 2003; Haraway 2008:3–5; Watts 2013; Hill 2013; Alberti 2016; Boyd 2017). This theoretical outlook is predicated upon an understanding of the world as constituted in ways that go beyond the human-animal binary postulated by the Western philosophical tradition, and see human nature itself as an interspecies relationship (Tsing 2012:144) or asserts that our relationships with other creatures are part of what makes us human (Kohn 2013:221). By not readily assuming that animals have always been treated as ontologically different from humans, we open up for the existence of practices that defy our established analytical categories.

Pitted Ware graves and post-depositional manipulation

The Middle Neolithic (circa 3200–2300 BC) represents a notoriously enigmatic period in Scandinavian prehistory, in which three partly coeval archaeological cultures, the PWC, the Funnel Beaker Culture (FBC) and the Battle Axe Culture (BAC), have been defined on an artefactual basis (overview in Edenmo et al. 1997). A number of recent aDNA studies support this pluralist model of the Middle Neolithic period, suggesting that the three archaeological cultures comprised genetically separate groups with little gene flow between them (Mittnik et al. 2018; Fraser et al. 2018; Coutinho et al. 2020). The present study includes PWC sites on the Swedish mainland and on the Baltic islands of Gotland, Åland and Öland as well as the Djursland peninsula in Denmark (Figure 1).

Ample finds of seal and fish bones in combination with stable isotope analyses of human bone from coastal PWC sites point to a diet rich in marine protein, setting them apart from both the FBC and the BAC subsistence strategies (Eriksson 2004; Fornander et al. 2008; Eriksson et al. 2008). Bones from wild terrestrial animals are also in evidence at the PWC sites, and finds of cereals hint at a multifaceted economy, although primarily centred around hunting and fishing (Vanhanen et al. 2019). Apart from the predominance of wild animals in their diet, small zoomorphic (as well as anthropomorphic) clay figurines are a regular occurrence on PWC sites (Almgren 1907; Janzon 1983). That the PWC people seem to have had a special relationship with certain animals is an almost axiomatic statement, with scholars suggesting that the treatment of animal remains and the practice of making zoomorphic figurines might be indicative of totemism (Gill 2003:150–152; Martinsson-Wallin 2008), animism, shamanism and

Figure 1. Map of the PWC sites mentioned in the text. Made with QGIS 3.10 using the Natural Earth dataset.

hunting magic (Wyszomirska 1984:114–116; Björck 2003), or an identity deeply connected to the prey animals (Stenbäck 2003:204; Eriksson 2004; Fornander 2011).

Gotland has long held a prominent position in PWC research due to the presence of grave sites providing rich insight into material culture and burial customs. In addition to Ajvide and Västerbjers, the largest burial places with 85 and 53 published graves respectively, graves or grave-like features have been found in smaller numbers on other sites as well. Outside Gotland, graves with preserved skeletal material are relatively scarce. Only Öland is comparable to Gotland, perhaps at least partially due to the favourable conditions for bone preservation provided by the calcareous soils on these islands, compared to the predominantly acidic and permeable soils on the Swedish mainland (Björck 2007:284; Larsson 2009a:53). PWC graves at mainland sites frequently contain only minimal amounts of bone or none at all, and are instead identified through the presence of oval pits, red ochre and irregular stone packings (e.g. Bagge 1938; Welinder 1971:17–21; Björck 1998:32; Lindholm 2003; Björck et al. 2008:325; Björck et al. 2020:95–100).

At first glance, most of the PWC graves on Gotland look fairly ordered, consisting primarily of single graves with the occasional double and triple grave. The dominant burial position is extended with the dead laid on their backs, arms placed along the sides of the body or folded over the chest. Graves featuring a flexed position also occur, albeit in limited numbers. The graves contain a variety of materials in the form of stone tools, bone or tooth pendants, seashells and unmodified animal bones and teeth. Ochre is present in some graves, sprinkled on top of the body or deposited in the form of lumps.

A closer look at the graves and features reveals that not all conform to this neat picture. In the case of Ajvide it has been noted that 42% of the identified graves lack substantial parts of the skeleton, contain only a few bones, or are completely empty (Wallin 2015). In the past graves found in such a state were often interpreted as destroyed through modern intrusions such as ploughing, ditch digging or gravel extraction (Janzon 1974:282; Burenhult 1997:58–59). Today it is generally acknowledged that many of these ‘destroyed’ graves had been subjected to post-depositional interventions in the Middle Neolithic, and that this should be viewed as a facet of PWC mortuary practices (Larsson 2003; Andersson 2004; Norderäng 2007a; Lindström 2019). Some have also suggested that the broad spectrum of mortuary treatments seen at the PWC sites, ranging from complete inhumations to the seemingly haphazard scattering of bones, can be construed as different stages in an extended process that ultimately served to guide the skeleton towards total annihilation, oblivion and a subsequent ‘perfect death’ (Wallin 2015; see also Nilsson Stutz & Larsson 2015 for similar thoughts on the Mesolithic burials at Zvejnieki).

Dispersed human remains have also been found in the cultural layers on several Swedish mainland sites (e.g. Almgren 1906:113; Olsson et al. 1994:60; Edenmo et al. 1997:181; Larsson 2006:40–44, 51–52; Larsson 2009b:119, Table 1). There are several examples of human remains in features or layers together with animal bones, often from seal and dog, and in some cases the human bones show signs of having been cut, split or burnt. This is the case at Bollbacken, Västmanland, where cremated bones from both humans and animals were found in a rectangular trench interpreted as a mortuary house (Larsson 2003). This structure and several other pits and trenches containing cremated bones were partly shielded from other areas of the settlement by a semi-circular row of post holes. Several features contained bones from both humans and dogs, and one pit yielded bones from four human adults and a dog (Formisto 1996:303–308).

Other examples of disarticulated human remains found dispersed in cultural layers are known from several sites on Åland, most notably Jettböle. Bones from at least seven humans were found among remains of two

harp seals and two dogs in a trench (Götherström et al. 2002). The human bones from Jettböle exhibit cut marks suggestive of disarticulation of the extremities by severing the joints, as well as marks from having been subjected to fire (Nuñez 1995:62). Similar cases are found at Ajvide, where a cut human bone has been found, and at Hemmor, where split human tubular bones was found among 80 kilograms of animal- and human bones in connection with a stone-set, rectangular hearth (Norderäng 2002; Samuelsson & Ytterberg 2003). Human bones were thus often treated in a similar manner as animal bones, both regarding the cutting and burning as well as the ultimate disposal.

Retrieving human skulls

Returning to the features definable as graves and their evidence of post-depositional interventions, the most eye-catching form of secondary manipulation is the removal of skulls. A total of nine graves from Gotland (eight from Ajvide and one from Ire) have been selected for discussion of skull removal here (Table 1). These are headless graves in which substantial portions of both the lower and upper skeleton remain intact, so that we can reasonably assume that the manipulation of the grave was carried out in order to procure the skull or parts thereof. There are mentions of ten skeletons without skulls at Ajvide, but the precise grave numbers are not given (Burenhult 1997:60, 2002:33). Following close examination of the available material, only eight graves at Ajvide meet the criteria.

Also excluded are graves with only the lower half of the skeleton intact. There are six such burials at Ajvide and five at Visby, from different parts of the sites, while upper half-only graves are entirely absent at Ajvide and only one dubious example has been found at Visby (Janzon 1974:296–299, 302, 312). The half skeletons should not necessarily be equated with the headless ones, and will not be included in a discussion regarding skull handling. There is however an intriguing bias in favour of lower half skeletons, which is difficult to explain away as a coincidence. The tendency towards lower halves is perhaps an indicator of less accurate interventions aimed at skull removal, which would suggest that the practice might have been even more common.

Since Ajvide is the most recently excavated grave site, as well as the site with the highest number of headless graves, it will be our starting point. The lack of crania, and in some cases entire skulls, in the graves at Ajvide has been taken to represent a PWC ‘skull cult’ related to ancestor worship, drawing comparisons with the plastering and caching of skulls in the Neolithic Near East as well as modern ethnographic studies (Burenhult

Table 1. The headless PWC graves suitable for a discussion of skull removal.

Site	Burial no.	Sex/age	Notes	Source
Ajvide	1	Female 17–19	Intersected by burial 2; finds include a flint axe, seal cranium, bone fish hook, four amber beads, five bone points, sturgeon scute, pig tusks	Burenhult 2002:53; Molnar 2008
Ajvide	4	Male 30–40	Intersected by burial 13; finds include a hammerstone, part of harpoon	Burenhult 2002:66–67; Molnar 2008
Ajvide	6	Male 17–25	Intersected by burial 7; teeth removed from skull; finds include four bone fish hooks, bone point, bone harpoon, five pig tibiae	Burenhult 2002:72–73; Molnar 2008
Ajvide	17	Female >60	Finds include a stone axe, part of a stone chisel, bone fish hook, bone point	Burenhult 2002:91; Molnar 2008
Ajvide	25	Male 20–25	Finds include two bird-bone beads, birch-bark roll, flint debitage	Burenhult 2002:99; Molnar 2008
Ajvide	30	Male 20–25	Remains from second individual found on thorax; no finds	Burenhult 2002:101; Molnar 2008
Ajvide	37	Male 20–30	Finds include a grinding stone, pig tusk, bone point	Burenhult 2002:103–104; Molnar 2008
Ajvide	48	Female 20–25	Finds include a seal tooth and red ochre	Burenhult 2002:108; Molnar 2008
Ire	7C	Male 50–60	Intersected by double burial (7A, B); finds include a bone harpoon	Janzon 1974:282–285; Gejvall 1974

1997:59–60). There are no indications suggesting that the headless graves are the result of people who were decapitated before burial, since the absence of cut marks on the cervical vertebrae indicate that the removal happened after decomposition (Burenhult 2002:46). Removal of the skull after decomposition is a common course of action in ethnographic examples from skull venerating societies (Armit 2012:99), and indicates knowledge or control of the putrefaction process. On the basis of post-depositionally manipulated graves at the Mesolithic site Skateholm in Scania, it has been suggested that such manipulations might have been pre-planned, and that hides could have been placed on the cadavers so that they could be buried while simultaneously facilitating access to the skeletal remains after decomposition (Nilsson Stutz 2003:310–312).

Three of the eight headless graves at Ajvide are part of what has been termed ‘T-shaped’ pairs, that is graves perpendicularly intersected in the

upper part by younger burials to form the shape of a 'T' (Figures 2 & 3; see also Andersson 2004). These pairs have been interpreted as a means of aiding older or physically weaker individuals by connecting them to already existing graves of younger individuals, or as a merging of human bodies into new entities (Fahlander 2013; Andersson 2016:343). There seems to be a selection process based on biological sex, in that males intersect males and females intersect females. This practice could be seen as centred around the pairing of bodies or graves rather than on the taking of the cranium or the entire skull, particularly since one of the T-shaped pairs (graves 14 and 15) is comprised of one complete inhumation dug into a grave entirely devoid of human remains. Some envision the skull removal as a way of creating a 'duoividual' or a composite body, while the cranium and mandible could be used for extended rituals (Fahlander 2013:235). The skull removal is then perhaps not central to this practice but could instead be seen as an additional benefit. The majority of the headless graves are however not the product of such intersecting graves, and there are graves dug into older graves in the southern part of the grave field that have not led to the removal of head bones (see Figure 3; graves no. 57, 58, 61, 62). What seems to be the common denominator is that the location of graves needs to have been marked above ground, and the chosen graves need to contain sufficiently decayed bodies so that the removal could be easily carried out. The headless graves presented here are also not limited to a certain part of the burial ground, with the exception that none are found in the southernmost and northernmost parts (Figure 3).

Regarding the overall pattern of skull removal from the graves at Ajvide, there is a slight numerical tilt towards males, with five males affected compared to three females. There is however a general predominance of male graves on most PWC sites on Gotland (Molnar 2008:20). Ajvide in particular stands out with a clear bias towards males, with 35 males identified compared to 20 females (Molnar 2008:Table 3). Not included in the osteological analysis conducted by Molnar are graves 83 (two children), 84 (male, 30–57 years) and 85 (female, >25 years) (Norderäng 2009:12–14, 16–18, 2010:27). Taking all this into account, the practice encompassed males and females in equal proportions, with about 14% of each lacking crania or entire skulls. The youngest affected individual was in her late teens and would probably have been considered an adult. The skeletons of children, although not immune to post-depositional manipulation in general (Andersson 2004), seem to have been exempt from the skull removal practice in the PWC graves on Gotland.

The distribution across biological sex and age seen in the headless graves at Ajvide is interesting to consider in light of the Near Eastern archaeological evidence that partly inspired the idea of a PWC skull cult. Earlier in-

Figure 2. A headless grave (no. 1, left) and an intersecting grave (no. 2, right) from Ajvide, Gotland (after Burenhult 2002:CD, plate 17c). Published with permission from Göran Burenhult.

terpretations of the plastered skulls from the Near East promoted the idea that they emanated from older males revered as ancestors, but Michelle Bonogofsky (2002, 2004) has shown that the modelling of skulls also encompassed females and children. This does not point to an exclusionary practice of making ancestors in the narrow mould of ‘old males’, but to an inclusive one focused on the handling and curating of skulls in general (Bonogofsky 2004:119). Likewise, Denise Schmandt-Besserat (2013) does not consider sex or other physical markers of individual identity as factors in the process of skull selection and modification in the Neolithic Near East, instead placing the skulls themselves firmly at the centre of the practice. The retained, displayed and venerated skull is something other than the specific individual from which it came.

While there are some headhunting or head venerating societies that seem to favour the heads of males, there are many examples that suggest the heads themselves to be far more consequential. Among the Yukaghir of

Figure 3. Map of Ajvide with the headless graves shaded. Notably, the headless graves are found in the central part of the site, and three of them are found in the cluster of ‘T-shaped graves’. The shape and location of the graves with dotted outlines are approximate. The inset shows the location of Ajvide in relation to the Middle Neolithic coastline. Graves 74, 75, 77, 78, 79AB, 80, 81, 82, 83, 84 and 85 are found to the north, while grave 76 is found to the south. (Modified from Fahlander 2013).

Siberia the practice of curating and adorning the skulls of dead male shamans has been documented by Waldemar Jochelson (1926:163–165), but judging from his account it would seem that it is the status of the shaman as a powerful entity that warrants this treatment rather than their sex. Other

ethnographic works lend further support to the suggestion that the skulls or heads themselves are sought after, and that these could consequently be obtained from men as well as women and children (see Barth 1987:4; Jan-dial et al. 2004; Armit 2012:59; see also Kelly 2000:5 on the concept of social substitutability). The severed heads of enemies can also be transformed into, and venerated as, ancestral objects among headhunting societies in southeast Asia (Hoskins 1996; Metcalf 1996). Ethnographically, the identities of individual heads seem to be more prominent factor in stratified societies, where genealogy is of greater importance (Armit 2012:67–68). It remains a possibility that the headless skeletons at Ajvide were purposely selected for skull removal based on memories of the unique abilities or particular life histories of the living persons. However, other than on an osteobiographical level, the life histories of these individuals are unknown to us, and we are unable to gain insight into this hypothetical selection process.

The spectacular grave 6 at Ajvide represents a hitherto unique twist on the practice of skull removal. It contained the headless skeleton of a young adult male and was initially, as with many of the other skull-less graves, thought to have been damaged by ploughing or unfavourable soil composition. The fact that a near complete set of teeth was found laid out in anatomical order in the grave, slightly to the side of where the skull should have been located, rendered those explanations impossible. Tool marks found on the teeth further showed that they had been forcibly removed from the mandible and maxilla. Laid out in this teeth collection, in place of the maxillary cuspids, were two phalanges from pig and seal (Burenhult 1997:58–59). This indicates that some of the removed skulls were subjected to further modification.

Given the ample finds of animal tooth pendants in graves and cultural layers, animal teeth removal must have been frequently practiced on PWC sites, and the Ajvide grave the practice of removing teeth was evidently extended to include a human. This raises questions regarding the ontological difference between humans and animals and points to a certain interchangeability, in which animal bones could be used to complete or enhance the human body. The fate of the replaced teeth is also interesting to consider. Were the teeth lost while the man was alive or were they left intact in the maxilla of the missing cranium? The removal of skulls in general raises the question of whether they might have been displayed or decorated before perhaps ultimately being deposited. It has been suggested that tooth removal was carried out on the plastered skulls from the Near East in order to give the impression of the skulls belonging to elderly individuals (Arensburg & Herschkovitz 1989), although that this represents a regular practice has been contested (Bonogofsky 2002). Another possibility is that the missing teeth were made into tooth pendants, a practice hitherto unknown for the

PWC but evidenced archaeologically by finds from Mid-Upper Paleolithic sites in the Czech Republic (Sázelová & Hromadová 2020) as well as Mesolithic Zvejnieki, Latvia, and Vedbaek, Denmark (Eriksson et al. 2003:7; Brinch Petersen 2016:54).

In a hypothetical *chaîne opératoire* of PWC skull handling, the act of procuring a skull would be the first of several possible steps. The deficit of skulls seen in the PWC graves is mirrored in the finds of crania, mandibles and scattered cranial fragments on many PWC sites, suggesting the possibility of shifting focus onto the treatment of the recovered skulls. How and where the skulls were ultimately deposited is perhaps a better indicator of their ontological status. Isolated skull fragments are more likely to be preserved and identified in the archaeological record compared to most other bone elements due to their overall robusticity and distinct appearance, potentially leading to apparent over-representation in scattered assemblages. On the other hand, some of the same factors that make skulls easily identifiable in the archaeological record (their peculiar shape, dissimilarity to the postcranial skeleton and so forth) may well also have influenced their selection for special treatment in the first place.

Human and animal skull deposits and selective treatment

Leaving the inhumation graves and focusing on the deposits of skulls or skull fragments allows us to crosscut some prevalent categorical divisions between humans/animals and subject/object, since the skull treatment is not reducible to a perspective that posits humans as subjects and animals as objects. Placing the skulls themselves and their surrounding find circumstances at the centre of the practice leads to a potentially different understanding of the human skull handling, which is aided further by considering the selective treatment of animal skulls on several PWC sites. As we have seen, skulls were in some cases removed from inhumation graves, and human skull fragments or human remains in general are not uncommon in cultural layers or in features containing animal remains (Edenmo et al. 1997:181; Hedemark et al. 2000; Götherström et al. 2002; Larsson 2009b).

Accepting that the skulls themselves and their materiality might have been an important factor in practices of removing and depositing human skulls, it becomes increasingly interesting to investigate some conspicuous contexts containing animal skulls on PWC sites. Moving on from the headless graves, our focus can be turned towards other evidence for skull handling, deposition and general selective treatment of skulls (Table 2). These also encompass certain features that have previously been interpreted as

Table 2. Examples of selective treatment of animal- and human skulls on PWC sites in south-central Scandinavia. Excluded from the table are finds of skull fragments without supporting evidence for deposition or sorting.

Animal/ human	Site	Context	Species	Notes	Source
Animal	Ajvide	Cultural layer	Seal	Lack of gnaw marks; skulls deposited or shielded from dogs?	Storå 2001:44
Human	Ajvide	Burial 22	Human	Cranial fragment and a mandible; Burenhult 2002:97 possible skull deposit?	
Human	Alvastra	Cultural layer	Human	Intact skull; cut-marked cranium; evidence of scalping?	Frödin & Fürst 1919
Animal	Fräkenrönningen	Cultural layer	Seal	Lack of gnaw marks; skulls deposited or shielded from dogs?	Olson 1999b:8
Animal	Högmossen	Cultural layer	Elk	Cranial- and antler fragments found at the center of area with several graves	Björck & Lindberg 2008:125
Animal	Jettböle	Deposit	Porpoise, seal	Three porpoise crania and three seal crania in stone feature with intact pottery vessel	Storå 2001:38–39
Human	Jettböle	Cultural layer	Human	Uneven distribution of skull fragments; sorting	Götherström et al. 2002
Animal	Jettböle	Cultural layer	Seal	Uneven distribution of skull fragments; sorting	Storå 2001:51
Both	Kainsbakke	Deposit	Bear, human	Crania and mandibles from 10 bears in a large pit with animal bones and human maxilla	Makarewicz & Pleuger 2020
Both	Korsnäs	Deposit	Dog, human	Dog cranium with clay bead in eye socket near human mandible and fire-cracked stones	Olsson et al. 1994:69
Human	Sittesta	Cultural layer	Human	Cranial fragments in connection with pottery vessel bases placed upside-down	Kihlstedt 2011:52
Animal	Tråsättra	Deposit	Otter	Mandible found next to a pottery concentration inside the remnants of a hut	Björck et al. 2020:174
Human	Västerbjers	Deposit	Human	Cranium found next to hearth with animal bones, flint debitage, pottery	Janzon 1974:34–35
Animal	Vedmora	Cultural layer	Seal	Lack of gnaw marks; skulls deposited or shielded from dogs?	Olson 1999a:95
Human	Visby	Deposit	Human	Burnt human cranial fragment in a hearth/burnt layer on top of a grave; with animal bones and flint debitage	Janzon 1974:33, 332

graves, such as burial 22 at Ajvide, containing only a cranial fragment and a mandible and therefore defined as a destroyed grave (Burenhult 2002:97). These bones have previously been interpreted as left behind when everything else was removed from the grave (Andersson 2016:343), but it may represent a deposit of a partial skull rather than an emptied grave, and is therefore included in this discussion. Excluded from the table are scattered cranial fragments with no supporting evidence for deliberate deposition. As we will see, the treatment of human skulls visible at PWC sites is not fundamentally different from that of animal skulls.

Most of the evidence for depositional acts involving human skulls come in the form of skull fragments, and to a lesser degree more or less intact skulls, found in both undifferentiated cultural layers and demarcated features. In Visby, a burnt cranial fragment was found in connection with flint debitage, pottery and animal bones from primarily dog, seal and pig (Janzon 1974:33). An entire cranium was also found just outside the edge of a large hearth at Västerbjers, with a deposit containing bones from various animals as well as pottery sherds and flint debitage (Janzon 1974:34).

Human skull fragments have also been found scattered alongside animal bones, pottery and other materials in cultural layers at Ajvide (Norderäng 2007b; Wallin 2015) and in Sittesta in connection with clay pots deposited upside-down near the Middle Neolithic shoreline (Kihlstedt et al. 2007:47; Kihlstedt 2011). Skull fragments, some of them burnt, have been found dispersed in the cultural layers at Korsnäs, Södermanland (Olsson et al. 1994; Fornander 2010:20; Svedin 2011:54). Human cranial fragments outside burial contexts are also known from sites in Uppland, Västmanland, Scania and Öland (Wyszomirska 1984:132, 134, 138–139). In the previously mentioned trench at Jettböle, where human remains were recovered, bones from the skull were underrepresented, suggesting removal of these skeletal elements for use elsewhere. For example, temporal bones from seven humans were found, but only five mandibles (Götherström et al. 2002).

At the famous Alvastra pile dwelling in Östergötland, a skull with cut-marks has been interpreted as an example of prehistoric scalping or human sacrifice (Frödin & Fürst 1919; During 1993). Like the cut-marked human bones found at Jettböle, this may be the result of mechanically accelerated defleshing. In addition, rather than representing mortuary treatment in a strict sense, it could be indicative of inter-group violence such as raiding and small-scale warfare, both of which are documented among recent hunter-gatherers (Roscoe 2009).

Animal skulls or skull fragments are of course also found in cultural layers, but without indications of special treatment and associated finds they are difficult to single out for further discussion. This is to some extent also the case with most human skull fragments found outside of identifiable

Figure 4. The stone feature at Jettböle, Åland. Two porpoise crania (upper left) as well as one cranium from harp seal (lower right, by the measuring stick). A total of three porpoise crania and three harp seal crania, as well as a complete clay pot, were recovered from the feature. (Photo: Jan Storå/Åland museum).

features, the difference being that some of them could theoretically have come from graves subjected to skull removal. It is hard to avoid placing more focus on the human skull fragments found in the cultural layers than the animal skull fragments found in similar circumstances, particularly as the former often are singled out in field reports and feature in the overall interpretation of the sites, while the latter are most often mentioned only alongside other animal bone fragments in an osteological analysis. There are also generally more animal skull fragments found in cultural layers than human skull fragments, and as such any credible argument of special deposition of animal remains is predicated upon a close consideration of taphonomic factors, associated finds and otherwise identifiable patterns (see also Hambleton 2013).

Notably seals are among the most common animals found on PWC sites, and their remains sometimes stand out as having received special attention. An area with high concentrations of seal bones and black soil at Ajvide has been interpreted as the remnants of a ritual area used primarily for the butchering of seals (Österholm 1997). Furthermore, complete seal crania have been found placed in a total of three at Ajvide (Norderäng

2001; Burenhult 2002:44, 111), while a further two seal crania have been found in a triple grave in Köpingsvik, Öland (Schulze 1978).

Analysis of the seal bone material from Jettböle shows an uneven distribution of skeletal elements. Cranial fragments are overrepresented in certain areas, creating a pattern suggesting selective depositional practices (Storå 2001:51). There is also a markedly low frequency of gnaw marks on the studied seal crania from Ajvide, while there are high frequencies on other skeletal elements (Storå 2001:44). A similar lack of gnaw marks on cranial bones from seals has been noted Vedmora and Hedningahällan, both in Hälsingland (Olson 1999a:95, 1999b:8), with the reservation that the bone material from Hedningahällan is highly fragmentary and burnt.

This might suggest that the seal crania were deposited in a manner diverging from the treatment of the postcranial bones (Storå 2001:44). While the latter were clearly exposed to scavengers such as dogs, the former were likely singled out and protected, probably by being buried or otherwise secluded from the influence of scavengers. In the case of Jettböle and Ajvide, Storå (2001:51) takes the selective treatment of seal crania as an indication that the seals were considered to possess souls, similar to humans, and therefore had to be taken care of in an appropriate manner. This is further echoed by Niklas Stenbäck (2003:204) who hypothesizes that the PWC people on Åland might have felt such kinship towards the seals that they regarded themselves ‘seal people’.

At Jettböle, a stone feature partly covering the crania of three harp seals and three porpoises provides yet another example of the particular treatment afforded to some animals (Figure 4). As well as the marine mammal crania, several intact spinal columns from seals and a complete clay pot were found in the feature. Judging by the articulation of the spines and the integrity of the clay pot, the deposit seems to have been made and closed relatively rapidly and with no significant later disturbances (Storå 2001:38–39; Stenbäck 2003:152).

This deposit at Jettböle has a fascinating parallel at Kainsbakke on Djursland, Denmark, where a large find-rich pit, previously interpreted as a waste dump, has recently been re-envisioned as a ritual feature. Among finds of pottery sherds, tools and flint debitage were skulls from brown bears and a large number of mandibles from elk, red deer and pig, two horn cores from aurochs and a fragment of a maxilla from a human female (Wincentz 2020:48–52). The bears were present in the form of two mostly intact crania plus several fragments of mandibles, maxillae and teeth from at least eight other bears, as well as phalanges. Given this distribution of skeletal elements, they are more likely to represent selected parts rather than the refuse from meals (Makarewicz & Pleuger 2020:301–303). Several of the bears are of advanced age, and strontium isotope analyses identify some as

non-local individuals, indicating that they were killed elsewhere and then were brought to Kainsbakke to be placed in the pit (Klassen et al. 2020).

A case of animal skull treatment predicated on detailed information of the spatial distribution of the remains is found at the middle Swedish site of Högmossen, where fragments of the cranium and antlers from an elk were found in a central area containing four graves. This is significant given that the grave area otherwise lacked animal bones and bones from elk were absent from the site in general, with the possible exception of tubular bones from an unspecified large herbivore (Björck & Lindberg 2008:125–126). Taken together this indicates that the elk skull may have been deposited in connection to the grave site.

Several excavations carried out at Korsnäs in Södermanland have yielded an assemblage of well-preserved bone material from both humans and animals. The most relevant find from Korsnäs is a pit containing fire-cracked stones and dark soil filled with fish bones, a dog cranium as well as a human mandible lying on top of a small stone chisel (Figure 5). A lump consisting of fish bones packed around a clay bead was found placed in the eye socket of the dog cranium (Olsson et al. 1994:69). An intimate connection between humans and dogs has been suggested elsewhere on the basis of two largely complete dogs placed in human graves at Västerbjers and Hemmor, as well as in the similar depositional patterns of human and dog remains on sites such as Bollbacken and Jettböle (Evans & Welinder 1997:285; Larsson 2009a:332–333).

The absence of cut marks on the human mandible, coupled with the absence of all other bones from both human and dog, would suggest that they were both placed in the ground in an already defleshed and disarticulated state (Larsson 2009a:274, 2009b:118). This has interesting implications for the older interpretation of the feature as a grave. If anything, this feature could be argued to draw attention to the dog rather than the human. Furthermore, there appears to be a very deliberate material connection between the dog and the human, and it might even be that the dog cranium and the human mandible were selected as combinable substances. The feature has been discussed by Mihael Budja (2011) in this regard, as an indication of an ontology in which bodies were partible and possible to combine in various ways.

In any case, this example represents a markedly elaborate assemblage, from the clay bead placed inside the lump of fish bones, to the placement of the entire lump in the eye socket of the dog cranium. It is a striking example of how skulls could be used as a focal point, and an indication that human and animal head bones could be used simultaneously and share attention. The clay bead found in the eye socket of the dog cranium might also suggest an emphasis on eyes and eyesight. The empty eye sockets of defleshed

Figure 5. Feature A2 at Korsnäs, Södermanland, consisting of fire-cracked stones, a human mandible and a dog cranium with a lump of fish bones and a clay bead in its eye socket. (Olsson et al. 1994 fig. 18).

human crania seem sometimes to have called for such treatment, as seen in the use of seashells as eye markings in the Near Eastern plastered skulls (e.g. Bonogofsky 2006) and the discs carved from deer vertebrae that were found inserted in the eye sockets of a human skull at Mas d'Azil in France (Schulting 2015:24). Examples from inhumation graves are however also known, such as the amber discs found placed on the eyes of some of the dead at the Zvejnieki cemetery in Latvia (Zagorska 1997), and slate discs used in a similar way on the dead at Kolmhaara in Finland (Edgren 2006).

The deposition of animal mandibles likewise has some implications for our understanding of how skulls might have been treated. Large amounts of pig mandibles, from 20–30 animals, have been identified in some PWC graves (Janzon 1974:282–285; Österholm 1989:155–156; Burenhult 2002:114–115). This has been taken as an indication that the pigs were domesticated and kept under human control, since it would be highly improbable for so many wild boars to have been killed in conjunction with the burials (Österholm 1989:28). Others have argued that the seasonality evidenced

through osteological analyses on pig bones from the PWC sites is rather uncharacteristic for pigs held in human captivity, and that the amount of mandibles could have been collected over the course of several years as the result of individual kills (Rowley-Conwy & Storå 1997). This keeping or curating of skeletal remains can also be inferred from previously mentioned depositions of bear skulls at Kainsbakke, as well as the Korsnäs feature.

Discussion

What can then be concluded regarding the treatment of skulls in the PWC? The broadly defined rubric of ‘skull handling’ encompasses a number of practices centred around the skulls of humans and animals alike, albeit manifested in different ways. On an overarching level, head bones, irrespective of whether they were from humans or animals, were often treated differently compared to the rest of the skeletal body. The concept of a PWC ‘skull cult’, suggested on the basis of the headless graves at Ajvide, can be usefully extended beyond Ajvide as well as beyond its anthropocentric focus. There are of course differences in the treatment of humans and animals but also several important similarities, such as the similar treatment and spatial distribution of human and animal remains at the PWC sites. Human and animal skulls have been deposited together in the same features, and human remains have been modified in ways that we commonly associate with animals, for example tooth removal and splitting and cutting of long bones.

Returning to the use of heads in ethnographic examples presented in the introduction, the PWC could certainly have used skulls or crania as heirlooms, charms or memory objects; there are several indications that animal and human skull bones were sometimes kept, perhaps displayed, before ultimately being deposited. Beyond this general idea of their in-between-state, skulls seem to have been used in different kinds of depositional acts. Skulls were capable of impacting the physical world of the living (Armit 2017:171). The presence of skulls and skull fragments in relation to graves and grave sites suggests a role in extended, multi-stage rites of passage in particular.

As we have seen, many archaeological and anthropological discussions on the use of human skulls posit them as potent objects with only faint connotations to the persons to whom they once belonged (Bonogofsky 2011:4). The weight is instead put on discussing how crania and mandibles could be used by the living as aides in passage rites or as atmospheric interventions (Armit 2012:61; Eriksen 2020). In these examples, the skeletal remains are not to be directly equated with individuals, but sometimes seem to embody faint traces of the deceased person. Some treatments of animal skulls, such

as those suggestive of seal crania being safeguarded from scavengers, might point to reciprocal relations between human hunters and their prey. Animal skulls would then also retain a sense of their animality, as something that could be further engaged with (Conneller 2004; McNiven 2013; see also Overton 2016). Human skulls retained traces of humanity without being equated with humans or specific individuals, and animal skulls retained traces of animality without strictly speaking being those animals.

The role of the head as the seat for the sensory apparatus in both humans and other mammals is also important to consider. The ethnographic examples of rituals including both human and dugong skulls from the Torres Strait highlight how these can be used to mediate communication between the living and the dead as well as between human hunters and prey animals. In those examples, the skull bones function as enhancements that grant humans the ability to communicate and otherwise socially engage with animals or gain insight into the future (McNiven 2010, 2013; Bonney & Clegg 2011). It is conceivable that the crania and mandibles at the PWC sites could have been employed in a similar manner, as communicative conduits enabling social relationships with dead humans and animals.

There is nothing to suggest that removal of skulls from the PWC graves and the subsequent use of these in depositions was related to the individual identity or personhood of the dead. While the integrity of the human body was perhaps an initial factor at the time of primary inhumation in the PWC graves, the remains were evidently partible and reusable to a high degree following decomposition. The defleshed human remains seem to have been unproblematic and open to a variety of post-depositional practices (see also Thomas 2000; Nilsson Stutz 2008:24). Removal of remains and the modifying and destroying of those remains would conceivably eradicate or dramatically alter any remaining notion of personhood, transforming the remains into something else.

The view of the headless graves working as anchoring points by which older and weaker individuals could be given assistance and ‘made dead’ (Fahlander 2013; Andersson 2016:343) suggests that the removed element could perhaps be employed in a similar fashion. Indeed, some evidence suggests that certain bone elements might have been curated until needed for deposition. The large quantities of mandibles from some PWC graves, the bear skulls from Kainsbakke and the defleshed dog cranium from Korsnäs are all examples that to varying degrees suggest curation. In the case of the bear skulls found at Kainsbakke, the isotope analyses further back up such a claim, since they show that the bears were brought to the site from different geographical locations. Likewise the dog cranium from Korsnäs must have been defleshed at the time of deposition for the clay bead to have been placed in the eye socket. All of these examples suggest that certain animal

remains were stored, perhaps even displayed, for a certain amount of time. It is possible that this extended to humans as well, since their skulls were sometimes removed from their original locations, and a certain life above ground as displayed or otherwise visible objects is not unlikely.

The use of human skull bones suggests that they were depositional objects among others. They were not necessarily at the centre of every depositional act nor clearly distinguished from animal bones in the deposits. Several of the features presented might be described as structured deposits, defined as an array of depositional acts involving artefacts and bones from humans and animals, that rest upon an underlying logic of cause-and-effect that might differ from our own understandings of causality, but that are nonetheless considered to produce practical outcomes (e.g. Brück 1999; Chadwick 2012; Hofmann 2020). This interpretation aligns with the use of skulls as ‘catheted objects’, efficacious or powerful charms or talismans that had magical properties, which Erica Hill (2006) has suggested as one of the primary functions of skulls cross-culturally.

Skulls could then perhaps be viewed as one of several possible components or ‘ingredients’ in depositional assemblages made up of a range of materials that were combined in order to affect the world in various ways by a drawing together of their properties (e.g. Pauketat 2013:41; Fahlander 2013, 2020). By focusing on the skulls themselves, and acknowledging the varied treatment of crania, mandibles and isolated cranial fragments in different depositional contexts, we can suggest a practice in which skulls were acquired as depositional resources to be either used directly or kept for later use. In summary, and contrary to some interpretations of post-depositional manipulations of the PWC graves envisioning them as acts designed to aid the dead on their journey to the afterlife (Andersson 2016:343–345), we might be dealing with acts involving parts of the dead without the acts themselves strictly speaking being directed *towards* the dead. Skull removal was not for the benefit of the buried, but for the living as a way of gaining access to skull bones that could be used in a variety of depositional practices.

Conclusion

The handling of skulls seen at PWC sites in south-central Scandinavia ranges from post-depositional removal of human skulls from inhumation graves, through deposition of intact crania and mandibles, to dispersal and sorting of skull fragments in cultural layers. The even age and sex distribution visible in the headless inhumation graves on Gotland does not suggest any preference for the skulls of a particular portion of the human population. Perhaps rather than viewing the skull removal as a special type

of mortuary ritual, it can also be seen as means by which the community could gain access to special objects suitable for extended treatment and subsequent deposition. The treatment of human skulls can then be usefully compared to the keeping and depositing of animal skulls that was evidently also practised in the period. Skulls from humans as well as animals could then be understood as prized and efficacious objects that were collected, displayed and finally deposited in order to effect change.

Some finds of animal skulls suggest that they were expediently covered in order to protect them from scavengers, while others are the result of skulls or heads being kept for a while and then brought together, sometimes with human skull bones, to be deposited on special occasions. There is no obvious ontological difference made between humans and animals in many of those contexts, and a binary separation is therefore not an adequate starting point for understanding the treatment of skulls at the PWC sites. Skulls were implicated in a wider set of engagements involving the skeletal remains of humans and animals, where they continue to be implicated in social processes post-mortem through retrieval, modification, possible display, dispersal and deposition. If the posited PWC skull cult existed, it was as a collection of heterogeneous practices that involved skulls from animals as well as humans.

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