‘Gifts for the gods’: lake-dwellers’ macabre remedies against floods in the Central European Bronze Age

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The lake-dwellings of the Circum-Alpine region have long been a rich source of detailed information about daily life in Bronze Age Europe, but their location made them vulnerable to changes in climate and lake level. At several Late Bronze Age examples, skulls of children were found at the edge of the lake settlement, close to the encircling palisade. Several of the children had suffered violent deaths, through blows to the head from axes or blunt instruments. They do not appear to have been human sacrifices, but the skulls may nonetheless have been offerings to the gods by communities faced with the threat of environmental change.

Keywords: Central Europe, Federsee, Lake Nussbaum, Late Bronze Age, lake-dwellings, human sacrifice, offerings, environmental change

Introduction

The prehistoric lake-dwellings of the Circum-Alpine region are known worldwide for their invaluable, well preserved archaeological evidence. Since their first discovery at Lake Zurich in 1854 (Keller 1854), they have contributed to myriad scientific developments in archaeology, ranging from reliable palaeo-climatic and palaeoenvironmental reconstructions to prehistoric and historic socio-economic studies (Menotti 2004)—including the establishment of a 12 000-year-long dendrochronological sequence (Friedrich *et al.* 2004). Amongst this list of practical advances though, they have also revealed evidence of unusual and macabre human behaviour intended to counter the threat of environmental change.

The harsh lacustrine environment often forced the lake-dwelling communities to protect themselves from unexpected climate variations—their struggle against transgressive lake

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levels is well documented throughout the entire lake-dwelling tradition (forty-third to seventh centuries BC) (Menotti 2001; Arbogast *et al.* 2006; Billamboz 2010; Magny 2013). It is also important to point out, however, that despite the apparent synchronisation between periods of lake-dwelling occupation and periods of severe climatic decline, it has been shown that climate was only one of several factors influencing the establishment and decline of lake-dwellings (Jennings 2012). Indeed, in specific areas, for example Zurich Bay (Lake Zurich) and around Lake Neuchâtel, some settlements (e.g. Zurich-Alpenquai and Zurich-Wollishofen Haumesser) did not span a whole period of climatic favourability.

Preventative measures consisted mainly of architectural adaptations to the often water-saturated and/or inundated terrain—houses were either elevated on stilts (if the village was erected close to or in the water), or on top of a well-insulated wooden surface built directly on the ground (if the settlement was far enough from the lake-shore) (Menotti 2012: 132–39). Such protections were effective most of the time; however, there were periods when lake transgressions were not temporary but, owing to major climatic variations (increase in humidity and precipitation), persisted for long periods, flooding the entire settlement (including the interior of the houses). As a result, people were forced to relocate their habitations to drier areas, as was the case for the Middle Bronze Age lake-dwellers of the northern Circum-Alpine region (Menotti 2003).

Interestingly, regardless of how severe or long-lasting the flood was, the lake-dwellers always repopulated the lake-shores, once the threat ceased. This did not, however, happen in the Late Bronze Age (LBA), when, after yet another lake-shore abandonment (ninth to eighth century BC), the lacustrine communities decided not to settle the shores anymore, thus terminating a way of living—the lake-dwelling tradition—that had persisted for more than 3500 years.

Thorough investigations in most of the last-occupied LBA lake villages have revealed that those communities did not give up without a fight—their resilience against the climatic enemy was admirable, though, in some instances, it degenerated into desperate behaviour (Baumeister *et al.* 2009). In the second half of the ninth century BC (and in some areas even earlier), climatic conditions started to deteriorate and humidity and precipitation increased, causing hydrologic imbalance on most of the northern Circum-Alpine region lakes and their catchment extents (Magny 2004; Billamboz 2010). Such climatic variations accompanied by lake level transgressions were not uncommon in the Bronze Age; one occurred towards the end of the sixteenth century BC and another in the ninth century BC (Menotti 2001, 2003).

In most cases, communities' protective measures against lacustrine floods were purely pragmatic; for instance, they consisted of erecting palisades (incidentally, most of them made of bog pine (*Pinus rotundata*), a species that prefers waterlogged areas—see Billamboz 2003) not only for defensive purposes, but also to stop the advancing lake water. In the Late Bronze Age however, rational actions became associated with ritual activities, which in some cases involved macabre offerings. In two of the best-researched LBA lacustrine settlements (Wasserburg-Buchau, Germany and Ürschhausen-Horn, Switzerland), archaeologists have found human remains (mainly skulls) of young children being re-deposited as 'gifts' to the gods long after primary burial, in order to stop the threatening floods. Two of the Wasserburg-Buchau skulls (found largely intact) also show signs of brutal violence (Menninger 2009b).

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A striking similarity that binds all the child skeletal remains together is the location where they were deposited; all of them were found (still *in situ*) near the settlement perimeter (Kimmig 1992; Gollnisch-Moos 1999; Schöbel 2009). Moreover, all the remains were deposited exactly at the time when the severity of flooding became greater. Were these the first signs of a practice that would continue, and actually intensify, in the centuries to come? In fact, starting from the Iron Age, throughout the Roman period and, in some cases, even much more recently, evidence of human sacrifices/offerings (though not necessarily involving children) in wetland milieus is well known all over Northern Europe, as confirmed by the numerous bog bodies found in peat bogs and other water-saturated environments (Van Der Sanden 1996, 2013). However, the uniqueness of the three lake-dwelling sites studied here is that the various pieces of the archaeological jigsaw (e.g. cause and effect, chronology, location and forensic analyses) all fit together perfectly, allowing us to see how human desperation may sometimes lead to irrational actions in order to avoid 'the worst'.

Siedlung-Forschner, Wasserburg-Buchau and Ürschhausen-Horn lake villages: geographical, chronological and archaeological context

The pragmatism towards environmental change reflected by the Bronze Age lacustrine communities of the Circum-Alpine region is striking. Although flooding events were certainly not the only cause of lake-shore abandonment (see Menotti 2003; Pétrequin *et al.* 2005), archaeological evidence shows that the lake-dwellers did not give up without a fight when threatened by transgressive lake levels. However, no matter how severe the danger might have been, the various remedies were essentially rational; from erecting 'anti-flood' fences to elevating the houses on stilts (see Perini 1987). This is, of course, not to say that irrational protective measures against the environmental enemy were not adopted—if they were though, most of them did not survive in the archaeological record for us to see. One Middle Bronze Age and two Late Bronze Age lakeside settlements are nevertheless exceptions. Siedlung-Forschner, Wasserburg-Buchau and Ürschhausen-Horn (all located in the northern Circum-Alpine region, within a radius of 40km) retain clear evidence of desperate (possibly even macabre) human behaviour to stop something much bigger than those communities could have ever imagined.

Siedlung-Forschner

This Early/Middle Bronze Age lacustrine village lies within the Federsee basin, some 50km north of the German shore of Lake Constance (Figure 1). It was discovered in the 1920s, but not properly excavated until the mid 1970s (Schlichtherle 2009). Dendrochronological analyses on the large number of wooden piles found at the settlement have been able to identify three occupational phases: Phase 1 (1767–1717 BC), Phase 2 (1610–1600 BC) and Phase 3 (1515–1481 BC) (Billamboz 2009b: 433).

A striking similarity that Siedlung-Forschner shares with the two sites below is not only the significant lake-level transgression before the settlement was abandoned for good at the end of Phase 3 (Figure 2), but the analogous human remains (fragments of a child's skull), found here, as in the other cases, near the protective palisade (see below, and Figure 3a).

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Figure 1. Geographical locations of the three sites studied.

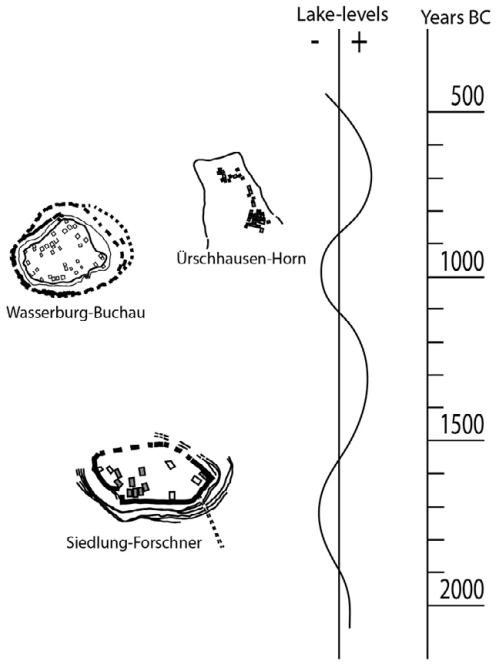

Figure 2. Chronology of Siedlung-Forschner, Wasserburg-Buchau and Ürschhausen-Horn in relation to the various lake-level fluctuations.

Wasserburg-Buchau

Wasserburg-Buchau is also located in the Federsee basin, only 500m from Siedlung-Forschner, and it too was discovered in the 1920s and subsequently excavated through a series of research campaigns until the late 1990s (Reinerth 1928; Kimmig 1992; Schöbel 1998). Although now located around 3km south of the lake, the prehistoric village lay immediately on the lake-shore at the time of occupation. As far as chronology is concerned, tree-ring analyses (Billamboz 2004, 2009a) have identified three settlement phases, spanning the eleventh to the ninth centuries BC, but alternating with evident hiatuses: Phase 1 (1058–1054 BC), Phase 2 (1006–925 BC) and Phase 3 (867–853 BC). It is interesting to note that the high resolution of dendrochronology even suggests a further division of Phase 2 into three more distinct sub-phases, namely 2a (1006–988 BC),

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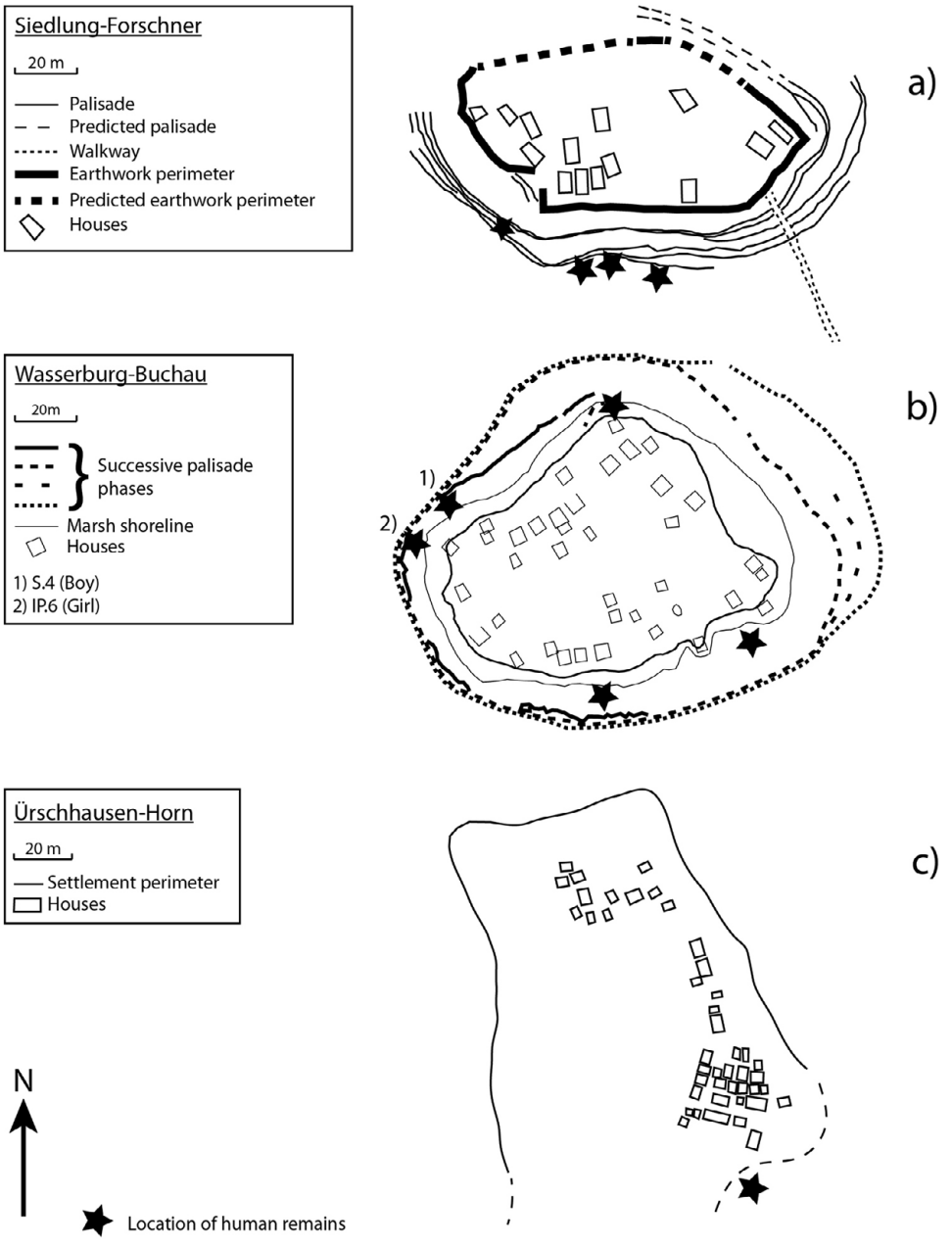

Figure 3. Location of human remains at a) Siedlung-Forschner, b) Wasserburg-Buchau and c) Ürschhausen-Horn.

2b (964–945 BC) and 2c (932–925 BC) (Billamboz 2009a: 36). Whether these two extra phases should be regarded as distinct occupations, and divide the entire Wasserburg-Buchau chronology into five (rather than three) occupation periods, is still debatable (André Billamboz *pers. comm.*). Also unclear is whether the increased efforts at 'land reclamation'

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from the bog-like terrain were due to demographic 'pressure'. What is certain is that the settlement was finally abandoned towards the mid ninth century BC, and the area never occupied again. A possible reason for this final abandonment was a significant imbalance of the local hydrology, which resulted in severe lake-level transgressions (Figure 2).

Amongst the rich archaeological record obtained from the various excavations, the human remains of five children scattered around the perimeter of the settlement (Figure 3b) are of particular importance. These remains consisted of skulls only, and they were deposited (not properly buried) near the protective palisade (Schöbel 2009).

Ürschhausen-Horn

This Late Bronze Age lakeside settlement lies on the shore of Lake Nussbaum, Switzerland, some 80km south-west of the Federsee. Dendrochronological and ^{14}C dating argue for a two-phase occupation, with the main phase in the ninth century BC, and the second in the seventh century BC. While we can state with a certain degree of confidence that the Phase 1 settlement was built between 870 and 850 BC, there are still doubts as to when it was abandoned—it is commonly agreed, however, that all inhabitants had already left it by the end of the century (i.e. *c.* 800 BC). Sedimentological evidence indicates that there was a period of water encroachment shortly before the abandonment of the site, with subsequent inundation of the entire area (Gollnisch-Moos 1999). As far as the second phase (seventh century BC) is concerned, the chronology becomes less reliable; still, archaeologists are quite confident that the short settling must have occurred sometime between 650 and 635 BC.

It is, however, the first occupation that is of most interest here—in fact, it is towards the end of it that the remains of a child were deposited on the periphery of the lacustrine village (Figure 3c). In this case though, due to taphonomic processes involving inundation and agricultural activities, the main preserved part of the skull was the mandible and, intriguingly, there were also a few other bones next to it (two femora, two tibiae, two humeri and a few bone fragments) belonging to the same child (Gollnisch-Moos 1999; Baumeister 2009). Just as at the two settlements at the Federsee, the human remains of Ürschhausen-Horn were also deposited during a drastic change in climatic conditions, with major lake-level transgressions (Figure 2).

Human remains: anthropological and forensic analyses

The similarity of deposition of all of the above-mentioned human remains is striking. All save one are children younger than 10 years of age, include skulls, and in two settlements (Wasserburg-Buchau and Ürschhausen-Horn) the deposition occurred even in the same period (mid/late ninth century BC, within ±20 years). The human remains were all placed (not properly buried) near the palisade (see Figure 3) during a significant lake-level transgression (see Figure 2).

While in Siedlung-Forschner the various skull fragments (found in four different locations) are those of one single child, in Wasserburg-Buchau the child skull fragments (found in five different locations) belong to five individuals. It is, however, interesting to note that for all skulls (including that of Siedlung-Forschner), the mandible is missing. Three of the five Wasserburg-Buchau skulls are badly damaged and sex could not be determined,

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Figure 4. Skulls of two of the children: left) S.4 (boy); and right) IP.6 (girl); both found at Wasserburg-Buchau (©R. Baumeister, Federseemuseum Bad Buchau).

though it is clear that their ages range between 2 and 16 years old (e.g. WR.2 303a/391a = 2–6 years old; S.9 = 4–10 years old; and 393a/390a = teenaged) (Trautmann & Wahl 2009). Two skulls (S.4 and IP.6; see Figure 4) are fairly well preserved, allowing detailed forensic analyses to be carried out. Skull S.4 was that of a boy (*c.* age 8), whereas skull IP.6 belonged to a girl of about the same age—the possibility has also been advanced that the two children were related (e.g. brother and sister), but recent aDNA analyses have failed to corroborate this theory (Parson 2009). Trace element and isotopic analyses (especially $^{87}Sr/^{86}Sr$) have also shed light on the nutrition, health and origin (e.g. birth place, local movements, etc.) of the two children. The two individuals seem to have had a predominantly vegetarian diet, their health was not optimal (chronic respiratory inflammation, anaemia, advanced tooth decay, etc.), and it can be confirmed that both children were born and raised in the Federsee region (Menninger 2009a; Stephan 2009). A certainty that has emerged from the analyses though, is the fact that both individuals met a gruesome death; the boy received a lateral blow to the head with a rounded stick-like object, and the girl was hit on the top of the cranium with a sharp implement (see Figure 5) resembling a typical LBA winged-axe (Figure 6), examples of which were also found in the settlement (Menninger 2009b).

The human remains from Ürschhausen-Horn differ slightly from the two Federsee sites; the individual is also a child (age 6–7), but in this case the remains consist of a mandible and parts of the postcranial skeleton (two femora, two tibiae, two humeri, and various small bone fragments). Also in this case evidence speaks in favour of symbolic skeletal-part depositions, occurring well after the individual's death. It is quite clear that these human remains were buried there intentionally as they do not show any sign of weathering due to longer exposure to the elements. The location coincides perfectly with that of Wasserburg-Buchau and Siedlung-Forschner—the remains were deposited at the edge of the village (just outside a stone-reinforced floodwall) during a major lake-level transgression (Gollnisch-Moos 1999).

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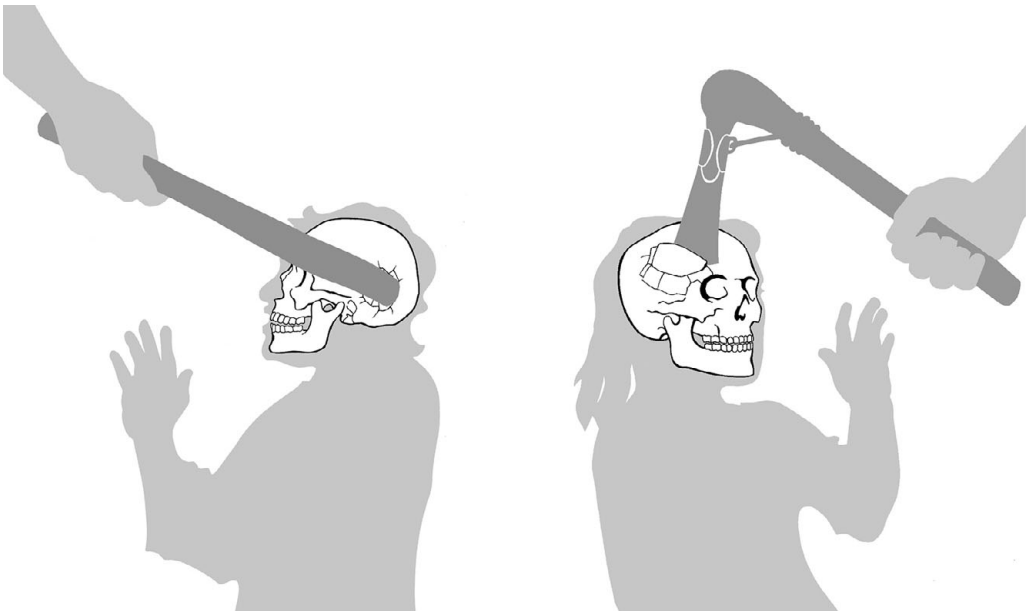

Figure 5. Possible explanation as to how the children were killed: left) boy; and right) girl (©Christina von Elm).

Bronze Age human remains in the wetlands: a wider perspective

While the burial practices of the LBA lake-dwelling communities in the northern Circum-Alpine region remain largely enigmatic, with few cemeteries associated with the settlements (e.g. Le Boiron (Beeching 1977) and Vidy-Chavannes (Moinat & David-Elbiali 2003)), human remains are more frequently reported. For example, a number of human bones (including also the jaw of a child of approximately eight years of age), were found at the LBA site of Zurich-Alpenquai (Lake Zurich)—but the dredging used during the excavation unfortunately destroyed all of the stratigraphic context and dating information (Künzler Wagner 2005: 52). As a result, the question as to whether those remains represented part of the lake-dwelling burial practices, or more macabre events, cannot be answered.

Human remains from lake-settlements are not confined to the eastern part of the northern Circum-Alpine region, but are also found in the western area. In fact, several skulls, all identified as adult, are recorded from settlements around Lake Neuchâtel (e.g. Mörigen, Nidau-Steinberg, Concise, Hauterive-Champréveyres and Grandson-Corcelettes (see Andrey 2006)). Unfortunately, unlike the three sites studied in this paper, these remains (as in Zurich) do not have full contextual information, making possible links to climatic change difficult to establish. However, these and other human remains from western Switzerland demonstrate that the deposition of skeletal parts (in particular skulls) in settlement contexts was not an uncommon practice among the lake-dwellings of the Bronze Age Circum-Alpine region.

In a wider European context, 15 adult human skulls were recovered from the Iron Age settlement of Glastonbury Lake Village in south-western England, and also in this case a number of them were deposited along the settlement perimeter (Coles & Minnitt

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Figure 6. Winged-axes from Wasserburg-Buchau similar in form to that which may have been used to kill the girl (IP.6) (©M. Schreiner, Archäologisches Landesmuseum Baden-Württemberg).

1995: 170–74, 203). Interestingly, it has been proposed (Cunliffe 1991: 507) that the frequent occurrence of human skulls in Iron Age settlements in England represents a special social interest in the head/skull, with excarnation and selection of specific bones for cultural retention (even in houses) and disposal of the remainder in burial practices. When considering these human remains, it is important not to confuse them (especially those from wetland settlements) with those from peat bog contexts—usually known as 'bog bodies'. Occurring in the peat bogs of Northern Europe, many of these amazingly well preserved bodies show significant signs of violence, but were deposited in a largely complete state (Van Der Sanden 2013). Evidently, different social practices and attitudes were responsible for the diverse deposition practices highlighted in the wetland-settlement and wetland-environment locations.

The relatively small data set used in this study is primarily the result of nineteenth and early twentieth century excavation techniques, which provided insufficient contextual information for comparative analyses. Similar sites to those considered here do, however, exist (e.g. on Lake Neuchâtel, see above), showing that the deposition of human remains in settlement contexts was relatively common in northern Circum-Alpine lake-dwellings during the Bronze Age. It is also evident that the deposition of human skulls, in particular, diverges from the 'normal' burial practice in the region, with cremation burial and inclusion of selected long-bones—but not skulls—identified at, for example, the LBA cemetery of Le Boiron (Lake Geneva, Switzerland; Beeching 1977).

Murders, mercy killings or 'gifts' for the gods?

The varying practice and nature of deposition between settlements and environments most likely reflects different functions for the deposition. Many of the bog bodies with significant signs of violence have been interpreted as ritual sacrifice or 'gifts for the gods', though such interpretations have recently undergone greater interrogation (cf. Menotti 2012: 198–201). The use of defined violence in ritual sacrifice, including burning, drowning, strangulation

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and blood sacrifice, is well recorded in Classical texts (Green 2002). However, while this clearly fits with the bog body examples, it might not with the remains from the lake-dwellings in the northern Circum-Alpine region. The violent acts seen on the skulls from Wasserburg-Buchau do not appear so controlled in either the act itself or the symbolic use of weapons, and therefore these bodies may not represent primary sacrifices (i.e. people killed intentionally as 'gifts for the gods').

It has been suggested that the two intact skulls (S.4 and IP.6; Figure 4) from Wasserburg-Buchau indicate that the individuals were not in optimal health (see above), though the complaints from which they suffered were nothing exceptional: tooth erosion is a common problem from hand-ground grain, and respiratory problems are not unusual when residing in humid environments. Such maladies would not appear to warrant mercy killing to ease the suffering of the individuals, and the children would not present sufficient physical deformities or abnormalities to warrant 'social euthanasia', as may have been the case with the Zweeloo Woman (Van Der Sanden 1996: 141). Besides, if the individuals were killed out of compassion, it would be sensible to expect some concessions to kindness made in their death; significant head trauma hardly seems a compassionate method.

The violence seen on the two skulls from Wasserburg-Buchau could also indicate that the individuals were killed—or murdered—during acts of aggression, either from within the settlement community, or during 'warfare' (Baumeister *et al.* 2009: 81–83). The weapons used to inflict the damage may support this; an axe and wooden bat (see above, and Figure 5) indicate unstructured violence that can occur during warfare or attack. It must be considered that other acts of violence may have been inflicted upon the individuals, but they simply cannot be observed as only the skull has survived. Similarly, the lack of violence observable on the Ürschhausen-Horn individual may simply be a result of non-preservation (or non-recovery) of the skull.

While it is likely that the human remains found at the northern Circum-Alpine region lake-settlements do not represent sacrificial 'gifts for the gods', it is evident that the skulls retained some particular significance to the community. The absence of a mandible from the intact skulls and other skull fragment depositions at Wasserburg-Buchau, various bones at Ürschhausen-Horn and Siedlung-Forschner, and skulls (and bones) at Zurich-Alpenquai and in western Switzerland attest to the deliberate selection of specific bones for retention, rather than being fortunate outcomes of taphonomic and preservation processes. A lack of marks indicating manual de-fleshing of the skulls, or indications of burning on the bones, point to natural excarnation followed by subsequent division of the remains for retention in the settlement, and/or deposition off-site. Where the remains were placed or excarnated until their deposition within the settlement boundaries is unknown. Therefore, it is possible to suggest that the human remains found within the lake-dwelling/wetland locations represent 'multi-part' or 'multi-stage' burials, with specific remains placed in different locations: skulls were retained within the settlement while other parts were disposed of in different manners and settings.

One of the traditional interpretations for the retention of skulls in settlements focuses on their role as 'ancestors' (e.g. Parker Pearson 1999; Armit 2012), but the childhood age of the skulls discussed here effectively removes them from the possible status of 'ancestor', and may suggest an alternative 'votive' explanation.

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Figure 7. Artist's impression of human skull offering in the Circum-Alpine region lake-dwellings (© Susanne Kiebler).

It is sufficiently clear that the head/skull formed a socially significant object to the communities of the lake-settlements, resulting in the deliberate deposition of those human remains in liminal locations at the edges of settlements—sited between the inside (dry) and the outside (wet) zones. Such settlement perimeter/wetland depositions may even represent an elaboration of the more-common LBA wetland deposition practices. A small metal hoard (consisting of Hallstatt B1 (*c.* 1000–900 BC) style arm-rings, a spear head and a winged axe) is also known from Wasserburg-Buchau, and, like the skulls, was also recovered from the perimeter of the settlement, near the palisade (Kimmig 1992). The intended function of bronze deposits remains unclear, but a more symbolic rather than functional aspect has been accepted in recent years, particularly for those placed in wetland environments (cf. Bradley 1990, 2005; Hansen 1994; Hänsel & Hänsel 1997). It has also been proposed that some metalwork hoards represent the participation of multiple actors in a communal event, as opposed to the individual deposition of objects (Fredengren 2011). Placement of high value bronze-work in votive offerings by multiple members of communities may represent supplication to the gods for beneficial events made on behalf of a whole community.

Similarly, the deposition of selected human remains in liminal wetland locations may also signify final entreaties and 'gifts for the gods' to protect against climatic deterioration, encroaching water levels and declining agricultural productivity—not as sacrificial victims, but as symbolic depositions (Figure 7). Infant members of the community may have died some years before, possibly during earlier phases of climatic decline, been processed in the typical method for lake-dwelling communities, their location of primary deposition in the environment recorded, and selected bones (skull) retained in the settlement area as significant 'objects'. In the face of climatic changes, 'traditional' metalwork depositions may

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have been made in attempts to appease the responsible deity, but in the face of continued climatic deterioration and the increasingly precarious position of the settlement, the community turned to more symbolic objects—the remains of their children. Furthermore, the offering of human remains may have involved many members of the community, and might also represent a continuation of (or addition to) the practice of metalwork deposition (see above).

Either recovered from the surrounding environment or removed from their location in the settlement, the use of infant (rather than adult) remains could have signified concepts of hope, continuity, the future and potential fertility. The recurrent instances of the deliberate deposition of skulls and other selected bones at lake-settlements certainly indicate that they held social significance, which developed further during the Iron Age across much of Central Europe (Armit 2012).

Conclusions

A strong processual research tradition has always highlighted the marked pragmatism of the Circum-Alpine region lacustrine communities in dealing with environmental threats. The only possible solutions to flooding and lake-level fluctuations were thought to have been rational—usually in the form of physical barriers (palisades), houses on stilts, and, with drastic events, even relocation. A recent re-consideration of the human remains found in these three Bronze Age lacustrine settlements (Siedlung-Forschner, Wasserburg-Buchau and Ürschhausen-Horn, all severely affected by flooding events before their final abandonment), has revealed that their inhabitants' resilience had also an irrational, if not macabre, side. Realising the ineffectiveness of pragmatic measures against the environmental hazard, the lake-dwellers turned to more desperate remedies to ask the deities for mercy, and offered them what they valued most: selected skeletal remains (in particular, skulls) of their children (Figure 7).

The socially-significant child skulls, retained by the community for the occasion, were deposited at the edge of the settlement in a highly symbolic liminal area near the palisade, between the dry (the village) and the wet (the transgressive lake) worlds. Despite the evidence of gruesome violence on some of the skulls (e.g. Wasserburg-Buchau), a careful study of the human remains and a thorough analysis of the various site formation processes show that the children were not necessarily 'sacrificed' on purpose for the offering event—the young individuals were in fact long dead when their skeletal remains were deposited as symbolic gifts. This highlights, all the more, the importance of depositions (whether of objects or human remains) in Bronze Age Central Europe; a phenomenon that was very much present amongst the lake-dwellers of the Circum-Alpine region.

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