Lasse Lukas P. Herskind & Sofie F. Hellerøe

Lasse Lukas P. Herskind is a PhD student at Aarhus University, specialising in prehistoric art. His work comprises a reassessment of engraved artefacts from the South Scandinavian Mesolithic (11.000-6.000 BP) through interdisciplinary and quantitative method development.
ORCID: 0009-0009-1729-351X
Sofie F. Hellerøe is a trained zooarchaeologist and current PhD student at Aarhus University in Denmark. Her research focuses on the changing relationship between humans and animals (wild and domestic) across the transition from foraging to farming around 6000 years ago in South Scandinavia.
ORCID: 0000-0001-9854-1312

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MEANINGFUL MESOLITHIC MARTENS?

A Multispecies Reassessment of the Mustelid remains from Tybrind Vig, Denmark

The presence of pine martens at prehistoric hunter-gatherer settlements has predominantly been interpreted as evidence of fur harvesting. In line with recent decades' criticism of anthropocentric interpretations, this article revisits the interactions between pine martens and humans at the well-known hunter-gatherer site of Tybrind Vig (ca. 5600-4000 BC) on the island of Funen. The pine marten remains at Tybrind Vig have been interpreted as evidence of specialised hunting reflecting early fur economies: at this settlement, several pine martens were skinned and the remains discarded on the outskirts of the settlement. From a socio-zooarchaeological perspective, we question this one-sided economic interpretation and, on the contrary, pinpoint indications that this particular species was deliberately and respectfully deposited after being skinned. In doing so, we draw inspiration from recent trends in the interpretation of archaeological evidence and contribute to the picture of animal-human relations in our distant past.

Introduction

The pine marten (*Martes martes*), a forest-dwelling mustelid, has a long history of interactions with humans. Following a southern European refuge during the last ice age, the species is thought to have been an early settler of reforested areas and a staple part of most European biotopes ever since the establishment of dense woodlands.[1] Throughout this period, remains of pine martens are frequently found in association with human activities, though in varying numbers. Scholars have proposed that in some Danish Late Mesolithic contexts (5400-3950 BC), pine marten exploitation seems to have intensified and taken the form of specialised hunting.[2] This interpretation is linked to the notion of a Late Mesolithic 'complexification' of the hunter-gatherer lifestyle, including delayed-return economic strategies (i.e., increasing investment of effort over time, such as storage, permanent fishing structures and trapping systems, resulting in wealth accumulation) and incipient social stratification. Previous research has proposed that the increase in fur-bearing animals in hunter-gatherer settlement contexts reflects an intensification of fur economies, as taphonomic and cut mark analyses have shown that the pine martens were often only skinned and not butchered for consumption.[3] These discussions of Late Mesolithic human-pine marten relations have thus primarily focused on economic incentives.[4]

In recent years, some archaeological subdisciplines have followed suit in the broader animal turn[5], resulting in several critical theoretical perspectives such as multispecies archaeology and social zooarchaeology.[6] These approaches have demonstrated the theoretical and practical possibilities of inferring 'meaningful' human-animal relations in archaeological contexts. With relevance to pine martens, the common categorisation of 'fur-bearing' species has been critiqued for leading to automatic interpretations of fur exploitation when these animals are recovered in archaeological contexts.[7]

Quite certainly, human-pine marten relations have not been a constant through space and time. The necessary approach must therefore be to investigate micro-scale contexts independently before broader assumptions can be qualified. Following a brief presentation of our case study – the Danish Late Mesolithic site of Tybrind Vig – this study provides a fresh perspective on human-pine marten interactions in the past through a framing of multispecies theory. By reassessing the archaeological evidence in light of both ecological and ethological knowledge of pine martens and further

1 Croose et al. 2013; Maroo and Yalden 2000; Sommer and Benecke 2004.
2 Andersen 1995, p. 51; Andersen 2013; Richter and Noe-Nygaard 2003.
3 Andersen 1995, p. 13; Richter 2005, p. 1230.
4 Aaris-Sørensen and Andreasen 1992, p. 36; Charles 1997, p. 266; Holliday 1998; Price 1983, pp. 766-769; Rowley-Conwy 1995, p. 92.
5 Andersson Cederholm et al. 2014; Weil 2010.
6 Overton and Hamilakis 2013; Pilaar Birch 2018; Russell 2012.
7 Overton 2016.

informed by ethnographic examples, we aim to confront the animal-as-resource perspective and hopefully ignite new ideas and discussions of how humans and animals interacted in the past, and how we might learn from this in the present.

The multispecies critique

The multispecies critique,[8] situated within the broader 'animal turn',[9] is in essence a critique of the Western, Cartesian nature/culture divide that still permeates the humanities as well as the social and natural sciences.[10] In this traditional paradigm, nonhuman entities are often treated as a static background to dynamic changes in human culture.[11] Much like the recent flourishing of feminist and indigenous approaches, the focus on nonhuman animals gives voice to a historically downtrodden party.[12] This viewpoint is evidently tied up with contemporary political and ethical movements.[13] Yet, compelling evidence has in recent years stacked up in support of nonhuman animal aesthetics, sentience, agency, etc.[14] The acknowledgement that non-human animal behaviour and characteristics have fundamentally co-shaped human history and prehistory[15] has paved the way for new archaeological perspectives. One such perspective is social zooarchaeology, which constitutes a branch of the broader multispecies critique. In the following, social zooarchaeological notions relevant to our Late Mesolithic pine marten study are outlined.

Walking larders and furbearers

Social zooarchaeology has voiced epistemological concerns regarding traditional zooarchaeological practice. This field has traditionally focused on species identification, quantification and human utilisation of animals as resources and sources of raw material. Such approaches can be highly relevant for understanding past human diets, yet it is argued that they do not holistically portray of how humans and non-human animals interacted in the past.[16] As Overton and Hamilakis phrase it, the implicit conception of animals as 'walking larders' denies animal agency and autono-

8 e.g., Haraway 2007.
9 see Andersson Cederholm et al. 2014.
10 Latour 1991/2006.
11 Armstrong Oma 2018, p. 2; Overton 2016, p. 571; Overton and Hamilakis 2013, p. 115.
12 Weil 2010, p. 2.
13 such as 'animal liberation', see Singer 2015.
14 Edelblutte et al. 2022, p. 8; Proctor 2012, pp. 632-635; Watanabe 2013.
15 e.g., Fudge 2013; see also Brittain and Overton 2013.
16 Boyd 2017, p. 205; Russell 2012, p. 7.

my.[17] Similar to the critique of the classification of large ungulates as 'meat' animals is the categorisation of 'fur-bearing species'. These fur-bearing species, including fox, badger, otter, beaver, pine marten etc., have historically been valued for their furs and subjected to massive harvesting.[18] Overton argues that the 'fur-bearing' categorisation itself leads to automatic interpretations; the contemporary reduction of animals to economic potential – valuable fur – fed by the capitalist market structure that shapes current Western world views, might erroneously affect our understanding of human-nonhuman relationships in past societies.[19]

The utilitarian approach to past animals has been supplemented with a symbolic one: As formulated by Lévi-Strauss, animals may not only be 'good to eat' and 'good to use', but also 'good to think with'.[20] Our hunter-gatherer past contains many examples that humans did indeed 'think with' animals in complex ways – most famously exemplified by the antler headdresses of Star Carr,[21] which has been used to infer Mesolithic animistic ontologies. However, this acknowledgement of non-human symbolic significance has been critiqued as merely extending utilitarian reductionism to symbolic reductionism.[22] Alternatively, it is proposed that a holistic understanding should rest on the acknowledgement that human societies are in fact 'web-of-species' societies in which many species take part in co-shaping and cohabiting the world.[23] This framing is applicable across spatial and temporal dimensions but can be assumed to be especially pertinent for hunter-gatherer societies.

Redressing nonhumans as dynamic subjects cannot be done through a change in discourse alone, but equally importantly through methodological adjustments. As Overton and Hamilakis grant, the traditional zooarchaeological methods should not be abandoned; the static quantification of an animal is still relevant but should be complemented with an appreciation of the dynamicity of the specific animal.[24] This includes ecological, ethological and ethnological considerations. Social zooarchaeology in practice also entails placing non-human agents at the same influential level as the human agents: in what sensorial and emotional setting did the two species meet; what were the salient features of this interspecies meeting; and how did these agents shape each other's behaviour? Not all of these questions can be answered unambiguously – especially not in a prehistoric setting – but recognising the importance of

17 Overton and Hamilakis 2013, p. 116.

18 Bridgen 2023.

19 Overton 2016.

20 Lévi-Strauss 1963, p. 89.

21 Starr Carr is a prominent Early Mesolithic archaeological site in northeastern England, well-known for the finding of 24 red deer 'frontlets', i.e., the top part of the skull with still-attached antlers. It is widely agreed that these frontlets were worn by humans and associated with shamanistic/animistic ritual practices. Conneller 2004.

22 Hill 2013, p. 118; Overton 2014, p. 61; Overton and Hamilakis 2013, p.114.

23 Armstrong Oma and Goldhahn 2020; Harris and Cippola 2017, pp. 162-163; Hussain et al. 2022, pp. 3-4; Overton 2018a.

24 Overton and Hamilakis 2013, pp. 118-119, p. 136.

these aspects helps us recognise that human actions are fundamentally co-shaped by non-human individuals.

In conclusion, multispecies archaeologies voice the suspicion that our modern perception of nonhuman animals as resources poses a bias on our interpretation of past lifeways. We here test whether this is the case for the specific context of human-pine marten interactions at Late Mesolithic Tybrind Vig. In line with this theoretical framework, a review of pine marten species characteristics will qualify the following discussion.

Pine marten ecology, ethology and ethnographic human-fur animal interactions

The pine marten (Ill. 1) is a salient animal in both appearance and behaviour. The species is native to Eurasia and favours mid- to late-successional forests,[25] weighing 1-2kg and measuring ca.70 cm from head to tail (males being slightly larger than females). Its semi-retractable claws – unique among mustelids – allow it to navigate complex vertical and horizontal structures, using both underground and arboreal cavities for denning and nesting.[26] A generalist predator, its diet includes voles, mice, fruits, insects, and birds, varying with seasonal availability.[27] Pine martens exhibit a cathemeral activity pattern, shifting between nocturnal and diurnal depending on competition and other factors.

Maroo and Yalden estimate British pine marten populations were 40 times higher in the Mesolithic than today[28] – perhaps unsurprising given the generally richer ecological conditions. A similar ratio likely applied to South Scandinavia. Due to the species' elusive nature and survey limitations, modern density estimates remain uncertain,[29] ranging from 0.1–1.75 individuals/km² across Europe, with some studies outside this range.[30] In Sweden, 15 individuals were documented within 5 km².[31] Mesolithic densities likely approached the upper end of this range, though territorial behaviour imposes natural limits.

Pine martens mature late and produce small litters, making them vulnerable to overexploitation, as historically documented.[32] Such overexploitation is directly linked to the historically valued, brown fur coat – an aesthetic feature of the pine marten which has likely always appealed to the human eye. Compared to other mustelids,

25 Proulx et al. 2005, p. 23.
26 Brainerd et al. 1995, p. 154.
27 De Marinis and Masseti 1995, p. 148.
28 Maroo and Yalden 2000, p. 246.
29 Birks et al. 2005, p. 249.
30 Manzo et al. 2011, p. 169; Sheehy et al. 2014, p. 229; Zalewski and Jedrzejewski 2006.
31 Lindström 1997, p. 39.
32 Helldin 2000; Macpherson and Denman 2015.

Ill. 1 The European pine marten (Martes martes) Image: Caroline Legg, CC-BY-2.0

pine martens are rarely encountered by humans, due to their lower adaptability to human-altered environments.[33] While it is unclear if this held true in the Mesolithic, encounters were likely seldom despite higher animal densities.[34] While contemporary literature focuses on fur utilisation, population surveys, and conservation,[35] the subjective and emotional history of human-marten relations remains ill-described. The characterisation of mustelids as 'pests', however, is distinctively modern, likely linked to predation on domestic poultry and similar invasions of the human agricultural world.[36] Conversely, ethnographic accounts associate pine martens with courage, agility, and ferocity, and traditional Mediterranean nicknames given to mustelids are associated with elegance and femininity.[37] As emphasised by Broch, indigenous marten trapping strategies in certain North American traditions are inextricably linked to an ethological and emotional understanding of the animal. These practices involve ascribing human-like agency to the martens, in observed behaviour as well as in mythologies. This forms an ethological understanding which is directly used in hunting and trapping.

The ethnographic study of the James Bay Cree (The Waswanipi community, Eastern Canada) provides significant insights into a long-standing human-fur bearer relationship which extends beyond economic considerations, incorporating sophisticated management and moral frameworks.[38] The study reviews how contemporary James Bay Cree hunters use and manage fur-bearer populations, noting that they collect information and evaluate their traditional hunting knowledge based on indicators of game population condition similar to those used by biologists. The Cree system

33 Balestrieri et al. 2018, p. 297; Overton 2018b, p. 217.
34 Proulx and Santo-Reis 2012.
35 Harrington et al. 2017, p. 190.
36 Birks 2017, p. 43; Harrington et al. 2017, p. 190; Mudappa 2013, p. 492.
37 Broch 2009.
38 Feit 1986.

of hunting territories is crucial for organising decisions about where and how many animals to hunt, and stewards monitor game populations to guide hunting efforts. Their practices demonstrate rotational use of territories and adjusted harvesting levels based on perceived population trends, leading to stable game populations over time. Crucially, the Cree worldview described by Feit includes "*conceptions of the moral bonds between men and animals*".[39] Animals are seen as having intelligence and will, and hunting success is understood as animals 'giving themselves' to hunters. This perspective entails reciprocal obligations for hunters, including responsible action, complete use of the animal, respectful treatment of its remains, and avoiding excessive killing for sport or greed. This cultural view informs their practices, fostering a morally significant relationship of accountable behaviour between humans and animals. Hunting decisions are thus tied to the perceived condition and 'intentions' of the nonhuman populations, with hunters potentially changing methods or ceasing hunting if animals are not 'giving themselves'.

This ethnographic example underscores the potential for complex, ethically laden human-animal relationships in hunter-gatherer societies, especially concerning animals valued for resources like fur. It suggests that interpretations of past interactions, such as those with pine martens, should similarly consider the possibility of deep ethological understanding and moral frameworks that govern hunting and the treatment of animal bodies, rather than focusing solely on a modern economic evaluation. As Feit notes, such indigenous management practices and systems are likely more common than previously recognised in various Native communities.[40] With this perspective, we suggest that other non-agricultural contexts of human-marten interactions – such as the prehistoric case study presented in the following – are more plausibly interpreted through a similar lens of anthropomorphism and genuine inter-species appreciation, rather than through a modern, Cartesian framework in which an animal is either prey or peer.

Case Study: Tybrind Vig

Located on the southwestern coast of present-day Funen, Denmark, Tybrind Vig is an iconic site of the South Scandinavian Ertebølle culture. Presently submerged under 2–3 meters of water some 200–300 meters offshore, the settlement originally lay on the shores of a sheltered lagoon, likely selected for its rich aquatic resources. Radiocarbon dates place its occupation between 5620–3710 cal. BC.[41]

Excavations from 1978 to 1987 were pioneering in the field of underwater archaeology and produced an extraordinary assemblage of material culture: lithic tools, bone

39 Feit 1986, p. 49.
40 Feit 1986, pp. 61-62.
41 Rasmussen 2013.

Species	NISP	MNI	Spatial distribution	Gnaw marks (NISP%)	Use (based on cut marks and breakage)
Human	?	4	Graves, otherwise scattered	0	none
Red deer	540	12	Scattered, sometimes in seemingly random concentrations	12	Skin, meat, marrow
Roe deer	209	7	Scattered	4	Skin, meat, marrow, tools
Wild boar	321	13	Scattered	6	Skin, meat, marrow
Pine marten	671	29	Four heaps	0	Fur
Polecat	42	3	Scattered	0	Fur (only one specimen with cut marks)
Otter	201	5	One articulated individual (represented by about a third of the bones), otherwise scattered	0	Fur, meat, marrow, brain
Wildcat	105	6	Unknown number of heaps	1	Fur, meat
Dog	58	5	Scattered throughout	5	Meat

Table 1. Selected mammalian species from Tybrind Vig, with information gathered from Trolle 2013. MNI: Minimum Number of Individuals. Species with NISP (Number of Identified Specimens, i) counts <5 (Aurochs, Wild horse, Fox, Water Shrew, Shrew, Red squirrel, Hedgehog & Water vole) are omitted.

and antler implements, dugout canoes, plant textiles, food remains, and a wide range of faunal material.[42] Marine archaeological excavations are notoriously difficult, and to date, only about 10% of the site's submerged refuse area has been excavated.[43] Pollen analysis points to a densely forested environment, with oak likely dominating the shoreline, corroborated by the discovery of oak trunks in the excavation area.[44] Other tree species included alder, hazel, elm, lime, and ash, with a reed belt likely occupying the shallow coastal waters.

The diverse faunal material from Tybrind Vig consist largely of what can be expected from a Late Mesolithic coastal occupation, with both marine, terrestrial, and avian species present.[45] The most anomalous feature of the assemblage is the high percentage of pine marten remains, which lies between 27-36%[46] of all mammalian remains from the locality (Table 1). This percentage dwarfs the general estimation that 'fur-bearing' species usually makes up 5% of the faunal material in South Scandinavian Mesolithic settlements,[47] inviting a closer inquiry into the potential significance of pine martens at this particular locality. While this case study focuses specifically on Tybrind Vig, comparable patterns at a small number of contemporaneous sites suggest that pine martens held cultural or practical importance across a wider region: the sites Agernæs, Vængesø III, and Ringkloster also show elevated relative frequencies

42 Bailey and Jöns 2020, p. 33.
43 Bailey et al. 2020, p. 52.
44 Andersen 2013, pp. 23–28.
45 see Trolle 2013 for a complete overview.
46 this uncertainty due to 243 bones where no distinction could be made between pine marten and polecat, Trolle 2013, p. 451.
47 Strid 2000, p. 5.

of pine marten remains and share distinctive characteristics such as clustered bone deposits and evidence of burning.[48] Though sites beyond Denmark, such as eastern Baltic Kääpa and Zvidze, exhibit different faunal profiles dominated by large game like elk,[49] their substantial absolute counts of pine marten remains further indicate that notable human engagement with the species was not geographically isolated.

These parallels suggest that Tybrind Vig should not be seen as an outlier, but rather as part of a broader set of practices and relationships involving pine martens in the Late Mesolithic. What distinguishes Tybrind Vig, however, is the quality of preservation and the depth of contextual information available, making it an ideal site for a focused reassessment of how this animal featured in human life at the time.

In sum, the Late Mesolithic archaeological site at Tybrind Vig is both internationally renowned and marks a central point in time for the development of marine archaeological excavation methods. Our understanding of the site remains dynamic, as contributions such as this one continually readdress the evidence from new theoretical and methodological angles. The following sections revisit the pine marten remains from Tybrind Vig from a social zooarchaeological perspective, exploring the possibility that human-pine marten relations were shaped not only by subsistence concerns but also by symbolic, social, or relational dimensions.

Revisiting the pine marten evidence of Tybrind Vig

Descriptions of the faunal material provide sufficient detail to assess how different species were treated at Tybrind Vig.[50] The pine marten remains are particularly notable: found in four clearly delimited heaps, all from the same temporal horizon ('Settlement B'), and radiocarbon dated to 4200–4100 cal. BC.[51] These deposits are among the latest at the site. Three of the heaps were located close together, with a fourth 25 meters to the west. These structured depositions consisted of (at least) six, (at least) four, three, and nine (ill.2) individuals, respectively.[52] However, as the minimum number of individuals (MNI) totals 29, it is not elaborated whether some animals were deposited elsewhere. This lack of detailed spatial documentation is likely due to the beforementioned methodological difficulties in this pioneering marine archaeological excavation. Only pine marten and wildcat were found in heaped deposits; the latter is mentioned only briefly and without context.[53]

48 Andersen 1995, p. 31; Richter 2005.
49 Lõugas 2017, Table 4.1.
50 Richter 2005; Trolle-Lassen 1986; 1987; 1990; Trolle 2013.
51 Andersen 2013, p. 69–70.
52 Andersen 2013, p. 69.
53 Trolle 2013, p. 464.

Ill. 2 In-situ photograph of the westernmost heap of pine marten remains, containing nine individuals. Photo: Hans Dal, in Andersen 2013, 67.

A thorough zooarchaeological analysis of the pine marten material is provided by Trolle,[54] a brief summary provided here. No marten bones show gnaw marks, and visible cut marks on pine marten skulls, jaws, and pelvises indicate skinning. The absence of butchery marks renders it quite certain that the martens were not consumed. With only three preserved baculi, a detailed sex distribution is not possible. The age determination shows a predominance of juvenile individuals, evidencing seasonal preference of autumn capture. Some remains also show burned teeth and crushed skulls. These may point to ritualised treatment or to killing methods involving fire and blunt force.[55] Near one heap, a row of flat stones may have formed a human-made path through the reed belt.[56] As previously mentioned, the high number of pine martens and their spatial clustering have been interpreted as evidence of specialised fur hunting. The dominant interpretation frames the material as refuse from skinning events-corpses discarded whole, with fur left on the snout and paws:

> "After skinning, the entire corpses, with fur intact on the paws and snout, were thrown out into the reed belt in the cove."[57]
> "Apparently, several individuals were often flayed at the same time and the combined waste thrown out in a heap."[58]

The existing work on this material has largely focused on economic utility, and as the above quotes underline, we can suspect that a modern mindset of 'waste disposal' of non-useful animal parts may pose a bias to the general interpretations. The following theoretical framing is an attempt to remove ourselves from this animal-as-resource perspective, exploring alternative readings of the evidence through an anthropological lens.

54 Trolle 2013.
55 Richter 2005, pp. 1227–1230.
56 Andersen 2013, pp. 63–65.
57 Andersen 2013, p. 294
58 Trolle 2013, p. 454.

Discussing the pine martens found at Tybrind Vig

After presenting the archaeological evidence, we can now return to the social zooarchaeological framework – additionally informed by pine marten ecological and ethological considerations – and ask: does the archaeological evidence allow for more-than-utilitarian treatment of the pine martens, and how far can we go in establishing the nature of human-pine marten relations at this particular site? First of all, the existing interpretation regarding the economic value of the pine martens is strongly supported, primarily due to the placement of cut marks – the fur was a valued resource and likely used for the manufacture of clothing, pouches or similar purposes. As contemporary and historical sources attest, this species' fur is coveted by humans, and presumably this was also the case in prehistory.[59] The question is whether the evidence allows for interpretations beyond that.

Despite all the unknown factors concerning life at the Tybrind Vig settlement, we can gather that humans and martens were ecological neighbours – humans at the coastal settlement, and mustelids occupying the forested hinterland. In spite of this proximity, however, mustelids had to be actively sought out in their own nocturnal, boreal world; a strategic effort was necessary, one that included stealth and cunning – the same characteristics that martens themselves have historically been attributed with. Following this social zooarchaeological rendering,[60] we can assume that such salient human-animal encounters impacted how the marten were treated post-mortem – they had agency in death as well as in life. This allows us to revisit the archaeological evidence itself and reassess what it tells us about human-pine marten relationships. The following subsections readdress particular, taphonomic questions by coupling the archaeological evidence with the previously outlined ethological and ecological considerations.

How were the pine martens captured?

The exact method of pine marten capture at Tybrind Vig remains unknown. Two possibilities are discussed in the literature: arrows and traps. A club-headed arrow was recovered at the site, but no direct evidence links it to pine marten hunting.[61] Trapping, however, is widely assumed, as Mesolithic groups were adept trappers, and traps are considered the least energy-intensive method for catching such elusive, nocturnal animals.[62] The method of capture matters. Overton argues that trapping creates a dislocated, indirect encounter between humans and shy species—quite un-

59 see Harris 2014.
60 Overton and Hamilakis 2013, p. 116.
61 Andersen 2013, p. 149.
62 Overton 2014, p. 263.

like the more interactive hunting of large mammals like deer or boar.[63] The difficulty of hunting pine martens, paired with their high frequency at Tybrind Vig, suggests they were regarded as meaningful beyond mere resource value. Their agility, stealth, and other attributes may have rendered them salient to humans. In animist ontologies, such traits can be transferred to humans through formalised acts during and after the hunt.[64]

Why were the pine martens subjected to specialised hunting strategies?

Pine marten remains make up approximately a third of the mammalian 'Number of Identified Specimens' (NISP) at Tybrind Vig, but given the limited excavation and long occupation span, these numbers should be interpreted cautiously. They primarily reflect a late phase of the site's long period of habitation. Fur exploitation is the standard explanation when 'fur animals' appear in archaeological assemblages. Yet, during the Atlantic period (c. 8000-5000 cal. BP), temperatures were higher than today,[65] and thermal protection in the form of pelts was likely not essential for survival. Ordonez and Riede argue that cold stress had not been a limiting factor in this region since the early Holocene.[66] Economic motives – such as surplus production or trade with Neolithic communities[67] – are plausible, but they do not explain the formal deposition of remains,[68] which makes the deliberate choice to not eat them or feed them to their domesticated dogs even more puzzling. The treatment of pine martens shares more with that of humans than other animals (see Table 1); They were not eaten, show no gnaw marks, and were deposited in structured ways. This supports the idea that these interactions involved symbolic or relational dimensions beyond practical use. We must also note, however, that humans were deposited individually (in graves), while the martens were placed in heaps, suggesting that individuality was not an important aspect of the marten deposits.

63 Overton 2018a, p. 302–306.
64 Conneller 2022, pp. 62–65; Nadasdy 2007.
65 Andersen 2013, p. 25.
66 Ordonez and Riede 2022.
67 Layton 2001, p. 296.
68 Enghoff 2011, pp. 295-297.

How did the pine marten remains end up at the Tybrind Vig settlement?

How did the remains end up at the settlement when the martens were almost certainly caught outside of the settlement area? The transport of animals back to the settlement is not self-explanatory, considering that a small species such as the pine marten could have easily been skinned on the spot and the remaining carcass been left behind at the place of capture.[69] The above review of pine marten population density and the ecological conditions at Tybrind Vig qualifies the assumption that pine martens were strongly present in the immediate vicinity of the human occupation. Humans would thus not need to travel far to obtain three to nine individuals (as the heaps suggest). Still, the transport costs of carrying a handful of pine martens back to the settlement seems conspicuous if the skinned carcasses were in fact just considered waste to be disposed of. The case for interpreting the marten heaps as merely post-skinning waste is weakened when considering this transport back to the settlement. It can, on the contrary, be argued that the act of moving an animal is a potentially meaningful interaction,[70] in line with the assumption of the active agency of dead pine martens, and that particular post-mortem treatment may have been considered morally necessary.

Why did the remains end up in four distinct heaps?

The idea that pine martens were simply "*thrown out into (...) the cove*" as waste[71] is difficult to reconcile with the physical evidence. No other species at Tybrind Vig – except perhaps wildcats (*Felis silvestris*) – were deposited in distinct heaps, and only pine marten remains appear in multiple, clearly defined concentrations. The survival of these heaps in their original formations suggests they were not disturbed by taphonomic forces such as currents, scavengers, or decay, indicating that they were likely protected before being submerged in the anaerobic layer in which it was preserved. One possibility is that they were placed in organic containers – such as textile sacks – which shielded the bones.[72] The expenditure of a container for the deposition of the remains would strengthen the hypothesis that the act of deposition held significance. Regardless, it is quite certain that the martens were not "thrown" but rather placed, perhaps along the beforementioned path of flat stones.

69 see Steffen 2023.
70 Overton 2016, p. 575.
71 Andersen 2013, p. 294; Trolle 2013, p. 454.
72 Andersen 2013, p. 63.

Andersen argues that such heaps confirm Horizon 2 as a refuse layer,[73] but the same type of evidence – articulated, concentrated animal remains in watery contexts – is interpreted elsewhere as ritual.[74] Chatterton notes that intentional deposition of whole animal carcasses in bogs and lakes was widespread in the Late Upper Palaeolithic and Mesolithic.[75] These deposits often involved non-utilitarian treatment of animals and may reflect deliberate cosmological acts. The pine marten deposits at Tybrind Vig fit this pattern. Ethnographic analogies further support this: 'Wasteful' butchering – where only select parts of an animal are used – is not uncommon among hunter-gatherers and is often cosmologically motivated.[76] What appears to modern eyes as waste may in fact be a culturally appropriate way of engaging with nonhuman others. At Cnoc Coig, a Mesolithic site in Scotland, otters were skinned and burned without further exploitation, a practice Conneller interprets as a respectful treatment of a significant animal.[77] This example stands in sharp contrast with the utilitarian interpretation of the Tybrind Vig evidence, even though the depositional patterns are strikingly similar. Fowler takes this further, suggesting that skinned and heaped pine martens at Ringkloster (Late Mesolithic site in Jutland, Denmark) may have been votive offerings – ritual acts rooted in an animistic understanding of multispecies relations.[78] Though such interpretations depend strongly on ethnographic analogy,[79] these patterns of Mesolithic, structured depositions are ambiguous to interpret and certainly warrant further discussion on how to recognise ritual or profane activity in prehistory.[80] Acknowledging that archaeological, structured deposits are not single-explanation phenomena, we here echo Morris' call for context-specificity when interpreting the intended meaning of such practices.[81] Our reassessment of the questions posed in the above highlights the likelihood that the human-pine marten relations at Tybrind Vig are complex, multifaceted and quite likely based on more than economic incentives.

Taken together, these practices point to a multispecies cultural history, in which pine martens are not static resources, but co-constitutive actors in Mesolithic lifeworlds. These insights open up for a broader reflection on how earlier multispecies relations may inform contemporary efforts to rethink nature-culture boundaries and live more attentively with other beings. The contemporary fur industry, in which mustelids and other furbearers are 'farmed' and their valued pelts subject to global

73 Andersen 2013, p. 69.
74 see e.g. the list of ritual animal use in Reitz and Wing 2008, p. 285.
75 Chatterton 2006, p. 104.
76 Hussain et al. 2022, p. 8; Priestley 2020.
77 Conneller 2022, p. 376.
78 Fowler 2004, pp. 80-81.
79 see Wendrich 2021 and Wilson 1992 for discussions on relying on ethnography and using ritual interpretations.
80 Grant 1991.
81 Morris 2010.

trade, is a salient parallel to our hunter-gatherer case; though the fur of pine martens have evidently been coveted by humans for millennia, the purely economic animal-as-resource perspective is likely not as ancient – in our Mesolithic case, at least, we have made a strong case for the presence of more complex interspecies negotiations interwoven with the acquisition of fur.

A new perspective on human-pine marten relations at Tybrind Vig (and beyond)

Based on the above discussion, we here list the several aspects of the Tybrind Vig evidence that support meaningfulness in the human-pine marten interactions:

The hunt: Pine martens were close ecological neighbours to humans, but the two species' different behavioural patterns meant that they would rarely meet. Ethnographic examples mentioning pine martens describe them as having impressive capabilities, desired by humans (elusiveness, agility, predatory proficiency). These factors qualify that a successful pine marten hunt would have been an especially salient and significant experience.

The transport: The pine martens were brought back to the settlement, and this possibly unnecessary transport cost does not fit with the notion of careless abandonment of the carcasses. On the contrary, it indicates that socially important actions made the transport worthwhile.

The non-comprehensive exploitation: Pine martens were skinned, but not eaten by humans or dogs, and their remains not utilised in any other way. As mentioned, ethnography underlines that such 'wasteful' behaviour in hunter-gatherer ontologies is often cosmologically motivated, very much unlike modern industrial processing of animal products.

The structured deposition: Unlike all other nonhuman animals at the site (except for wildcat), the pine marten deposits were intentional and ensured that the heaps were undisturbed. The expenditure of a container for these remains renders a careless abandonment very unlikely. These factors in combination allow for a drastic reassessment: in the latest phase of the Tybrind Vig settlement, the pine marten was an ontologically important part of human life. In the processes of acquiring its desired fur, the animals had to be treated according to important social customs, which seem to have been unique for this species. This included careful treatment of the skinned bodies, ensuring that these remained undisturbed. These human efforts were likely an attempt to maintain a good relationship with pine martens, their valued neighbours. Following Feit's example ethnography of the Cree, the trapping of a large number of individuals might have necessitated reciprocal acts related to the treatment of the remains. It is possible that a similar relationship existed between humans and wildcats at the settlement, but the available information regarding this evidence is

highly deficient. As the structured pine marten deposits at the contemporaneous settlements at Ringkloster and Agernæs are in many ways similar to Tybrind Vig,[82] it is a possibility that these meaningful relations between humans and pine martens could have been a more broadly shared cultural tradition. At other sites, however, the importance of pine martens is not readily apparent. Further detailed single-site analyses must be performed to ascertain the extent of this phenomenon.

Conclusion

The reassessment of the pine marten deposits at Tybrind Vig reveals how different interpretive frameworks yield radically diverging understandings of the same archaeological record. What has long been read through an economic lens – as evidence of specialised hunting for fur – has here been interpreted as a more nuanced practice of reciprocal interspecies relations, grounded in relational ontologies and informed by multispecies ethics. Drawing on social zooarchaeology, this paper has argued that the post-mortem treatment of pine martens at Tybrind Vig involved deliberate, structured actions that cannot be reduced to waste management strategies alone. These animals were not merely hunted and discarded – they were specifically targeted, transported, handled and deposited in ways which suggest social, symbolic and possibly spiritual significance, just as much as the practice was economically motivated. The inhabitants of the Tybrind Vig settlement had a dogmatic approach to how mustelids should be treated, and similar evidence from coeval sites strongly suggest that this species-specific treatment may have been a more widely shared cultural tradition. As informed by ethnography, one should never separate economic and symbolic behaviour in foraging contexts. The presence of pine martens in the archaeological record is not incidental, but central to understanding how Late Mesolithic communities related to and engaged with nonhuman life.

Importantly, this perspective contributes to ongoing debates about how we might rethink human-animal relations in the present. As modern societies grapple with biodiversity loss, habitat fragmentation, and renewed human-wildlife conflict, insights from the past may help unsettle entrenched anthropocentric assumptions and inspire more thoughtful, attentive ways of living with other species. Future research should continue to explore such relationships through site-specific, fine-grained analyses that foreground nonhuman agency and multispecies entanglements. In doing so, archaeology can serve not just as a window into the past, but as a provocative companion to contemporary discussions on sustainable and conscious co-existence.

82 as demonstrated in Richter 2005.

References

Aaris-Sørensen, Kim and Andreasen, Tine Nord 1992: "Small mammals from Danish Mesolithic sites." *Journal of Danish Archaeology* 11, p. 30-38.

Andersen, Søren H. 1995: "Ringkloster – Ertebølle trappers and wild boar hunters in eastern Jutland – A survey." *Journal of Danish Archaeology* 12, p. 13-59.

Andersen, Søren. H. 2013: *Tybrind Vig: Submerged Mesolithic Settlements in Denmark*. Jysk Arkæologisk Selskab, Højbjerg.

Andersson Cederholm, Erika et al. 2014: *Exploring the Animal Turn: Human-animal relations in Science, Society and Culture*. The Pufendorf Institute for Advanced Studies, Lund University, Lund.

Armstrong Oma, Kristin 2018: "Humanity and Animality". Sandra L. López Varela (ed.): *The Encyclopedia of Archaeological Sciences*, p. 1-5.

Armstrong Oma, Kristin and Goldhahn, Joakim 2020: "Introduction: Human-Animal Relationships From a Long-Term Perspective." *Current Swedish Archaeology* 28, p. 11-22.

Bailey, Geoff and Jöns, Hauke 2020: "The Baltic and Scandinavia: Introduction." Geoff Bailey et al. (ed.): *The archaeology of Europe's drowned landscapes.* Springer Open, Cham.

Bailey, Geoff et al. 2020: "Denmark: Mesolithic Coastal Landscapes Submerged." Geoff Bailey et al. (ed.): *The archaeology of Europe's drowned landscapes.* Springer Open, Cham.

Balestrieri, Alessandro et al. 2018: "Far from the madding crowd: Tolerance toward human disturbance shapes distribution and connectivity patterns of closely related Martes spp." *Population Ecology* 61:7, p. 289-299. DOI: 10.1002/1438-390X.12001.

Birks, Johnny 2017: *Pine Martens*. The British Natural History Collection vol. 8. Whittet Books, London.

Birks, Johnny et al. 2005: "Are scat surveys a reliable method for assessing distribution and population status of pine martens?" Daniel J. Harrison et al. (ed.): *Martens and Fishers (Martes) in human-altered environments: an international perspective*. Springer, Dordrecht.

Boyd, Brian 2017: "Archaeology and Human-Animal Relations: Thinking Through Anthropocentrism." *Annual Review of Anthropology* 46, p. 299-316. DOI: 10.1146/annurev-anthro-102116-041346.

Brainerd, Scott M. et al. 1995: "Pine marten (Martes martes) selection of resting and denning sites in Scandinavian managed forests." *Annales Zoologici Fennici, 32 (1), II North European Symposium on the Ecology of Small and Medium-sized Carnivores, Lammi, Finland, 8-11 April, 1994*. p. 151-157.

Bridgen, Adam 2023: "From the Pleistocene to COVID-19. A Brief History of Fur." Andrew Linzey and Clair Linzey (ed.) *The Ethics of Fur: Religious, Cultural, and Legal Perspectives*. Lexington Books/Fortress Academic, p. 15-27.

Brittain, Marcus and Overton, Nick J. 2013: "The Significance of Others: A Prehistory of Rhythm and Interspecies Participation." *Society and Animals* 21:2, p. 134–149. DOI: 10.1163/15685306-12341298.

Broch, Harald Beyer 2009: "Tracks that Matter: On Space, Place and Hare Indian Ethnobiology with special reference to the Marten (Martes americana)." *Acta Borealia* 26:1, p. 77–95. DOI: 10.1080/08003830902951540.

Charles, Ruth 1997: "The Exploitation of Carnivores and Other Fur-bearing Mammals during the North-western European Late and Upper Paleolithic and Mesolithic." *Oxford Journal of Archaeology* 16:3, p. 253–277. DOI: 10.1111/1468-0092.00040.

Chatterton, Richard 2006: "Ritual." Chantal Conneller and Graeme Warren (ed.): *Mesolithic Britain and Ireland. New Approaches*. Tempus, Stroud, 101-120.

Conneller, Chantal 2004: "Becoming deer. Corporeal transformations at Star Carr." *Archaeological Dialogues* 11:1, p. 37–56.

Conneller, Chantal 2022: *The Mesolithic in Britain – Landscape and Society in Times of Change.* Routledge, Abingdon.

Croose, Elizabeth et al. 2013: "Expansion zone survey of pine marten (Martes martes) distribution in Scotland." *Scottish Natural Heritage Commissioned Report no. 520*.

De Marinis, Anna M. and Masseti, Marco 1995: "Feeding habits of the pine marten Martes martes L., 1758, in Europe: a review." *Hystrix, the Italian Journal of Mammalogy* 7:1-2, p. 143-150.

Edelblutte, Émilie 2022: "Animal agency in wildlife conservation and management." *Conservation Biology* p. 1– 15. DOI: 10.1111/cobi.13853.

Enghoff, Inge Bødker 2011: *Regionality and biotope exploitation in Danish Ertebølle and adjoining periods*. Det Kongelige Danske Videnskabernes Selskab.

Feit, Harvey A. 1986: "James Bay Cree Indian Management and Moral Considerations of Fur bearers." *Native People and Renewable Resource Management*. *1986 Symposium of the Alberta Society of Professional Biologists (ASPB).* Edmonton, p. 49-65.

Fowler, Chris 2004: *The archaeology of personhood: An anthropological approach*. Routledge, London.

Fudge, Erica 2013: "The Animal Face of Early Modern England." *Theory, Culture & Society* 30:7–8, p. 177–198. DOI: 10.1177/0263276413496122.

Grant, Annie 1991: "Economic or Symbolic? Animals and Ritual Behaviour." Paul Garwood et al. (ed.): *Sacred and Profane – Proceedings of a Conference on Archaeology, Ritual and Religion. Oxford, 1989.* Oxford Committee for Archaeology, Oxford, p. 109-114.

Haraway, Donna 2007: *When Species Meet.* University of Minnesota Press, Minneapolis.

Harrington, Laura A. et al. 2017: "People and wild musteloids." David W. Macdonald et al. (ed.): *Biology and Conservation of Musteloids.* Oxford University Press, Oxford, p. 189–215.

Harris, Susanna 2014: "Sensible Dress: The Sight, Sound, Smell and Touch of Late Ertebølle Mesolithic Cloth Types." *Cambridge Archaeological Journal* 24:1, p. 37-56. DOI: 10.1017/S0959774314000031.

Harris, Oliver J.T. and Cippola, Craig N. 2017: "Multi-species archaeology – People, plants and animals." Oliver J.T. Harris and Craig N. Cippola (ed.): *Archaeological Theory in the New Millenium*. Routledge, Abingdon, p. 153-170.

Helldin, Jan Olof 2000: "Population trends and harvest management of pine marten Martes martes in Scandinavia." *Wildlife Biology* 6:2, p. 111-120. DOI: 10.2981/wlb.2000.006.

Hill, Erica 2013: "Archaeology and Animal Persons: Toward a Prehistory of Human-Animal Relations." *Environment and Society: Advances in Research* 4:1, p. 117–136.

Holliday, Trenton W. 1998: "The Ecological Context of Trapping among Recent Hunter- Gatherers: Implications for Subsistence in Terminal Pleistocene Europe." *Current Anthropology* 39:5, p. 711–719. DOI: 10.1086/204794.

Hussain, Shumon T. et al. 2022: "Being-with other predators: Cultural negotiations of Neanderthal-carnivore relationships in Late Pleistocene Europe." *Journal of Anthropological Archaeology* 66. DOI: 10.1016/j.jaa.2022.101409.

Latour, Bruno 1991/2006: Vi har aldrig været moderne. Et essay om symmetrisk antropologi. Hans Reitzel.

Layton, Robert H. 2001: "Hunter-gatherers, their neighbours and the Nation State." Catherine Panter-Brick et al. (ed.). *Hunter-Gatherers – An Interdisciplinary Perspective*. Cambridge University Press, Cambridge, p. 292-321.

Lévi-Strauss, Claude 1963: *Totemism*. Translated by R. Needham. Beacon Press, Boston.

Lindström, Erik R. 1997: *Lär känna skogsmården*. Svenska Jägareförbundet, Spånga.

Lõugas, Lembi 2017: "Mesolithic hunting and fishing in the coastal and terrestrial environments of the eastern Baltic." Umberto Albarella et al. (ed.): *The Oxford Handbook of Zooarchaeology*. Oxford University Press, Oxford. p. 52-68.

MacPherson, Jenny and Denman, Huw 2015: "Pine Martens in Britain and Ireland – Recovery, Restoration and relevance for forestry." *The Royal Forestry Society* 109:3, p. 181-185.

Manzo, Emiliano et al. 2011: "Estimation of population density of European pine marten in central Italy using camera trapping." *Acta Theriologica* 57, p. 165-172. DOI: 10.1007/s13364-011-0055-8.

Maroo, S. and Yalden, Derek William 2000: "The Mesolithic mammal fauna of Great Britain." *Mammal Review* 30, p. 243-248.

Morris, James 2010: "Associated bone groups; going beyond the Iron Age". J. Morris, M. Maltby (Eds.), *Integrating Social and Environmental Archaeologies: Reconsidering Deposition*. British Archaeological Reports Internation Series 2077, Archaeopress, Oxford (2010), p. 12-23.

Mudappa, Divya 2013: "Herpestids, viverrids and mustelids." AJT Johnsingh and Nima Manjrekar (ed.): *Mammals of South Asia* 1, Universities Press, India, p. 471-498.

Nadasdy, Paul 2007: "The gift in the animal: The ontology of hunting and human-animal sociality." *American Ethnologist* 34:1, p. 25–43. DOI: 10.1525/ae.2007.34.1.25.

Ordonez, Alejandro and Riede, Felix 2022: "Changes in limiting factors for forager population dynamics in Europe across the last glacial-interglacial transition." *Nature Communications* 13:1. DOI: 10.1038/s41467-022-32750-x.

Overton, Nick J. 2014: *Memorable Meetings in the Mesolithic: Tracing the Biography of Human-Nonhuman Relationships in the Kennet and Colne Valleys with Social Zooarchaeology*. University of Manchester administered thesis: PhD.

Overton, Nick J. 2016: "More than Skin Deep: Reconsidering Isolated Remains of 'Fur-Bearing Species' in the British and European Mesolithic." *Cambridge Archaeological Journal* 26:4, p. 561-578.

Overton, Nick J. 2018a: "The Rhythm of Life – Exploring the role of daily and seasonal rhythms in the development of human-nonhuman relationships in the British Early Mesolithic." Suzanne Pilaar Birch (ed.): *Multispecies Archaeology*. Routledge, London, p. 295-309.

Overton, Nick J. 2018b: "Can hunter-gatherers ever 'get to know' their prey?: The role of environmental experiences and daily interactions in the formation of human–nonhuman relationships in the British Mesolithic and beyond." *Hunter Gatherer Research* 4:2, p. 193–226. DOI: 10.3828/hgr.2018.10.

Overton, Nick J. and Hamilakis, Yannis 2013: "A manifesto for a social zooarchaeology. Swans and other beings in the Mesolithic." *Archaeological Dialogues* 20:2, p. 111-136.

Price, T. Douglas, 1983: "The European Mesolithic." *American Antiquity* 48:4, p. 761-778.

Priestley, Erica 2020: "Beating the Dead Horse?: Using Ethnography for Middle Palaeolithic Zooarchaeological Contexts in North-West Europe." Kyra Kaercher et al. (ed.). *New Frontiers in Archaeology: Proceedings of the Cambridge Annual Student Archaeology Conference 2019*, p. 136–152.

Proctor, Helen 2012: "Animal Sentience: Where Are We and Where Are We Heading?" *Animals* 2:4, p. 628-639. DOI: 10.3390/ani2040628.

Proulx, Gilbert and Santos-Reis, Margarida 2012: "A Century of Change in Research and Management on the Genus Martes." Keith B. Aubry et al. (ed): *Biology and*

Conservation of Martens, Sables, and Fishers: A New Synthesis. Cornell University Press, New York, p. 471-489.

Proulx, Gilbert et al. 2005: "World Distribution and status of the genus Martes in 2000." Daniel J. Harrison et al. (ed.): *Martens and Fishers (Martes) in human-altered environments: an international perspective*. Springer, Boston, p. 21-76.

Pilaar Birch, Suzanne 2018: *Multispecies Archaeology*. Routledge, London.

Rasmussen, Kaare Lund 2013: "Radiocarbon dates from Tybrind Vig." Søren H. Andersen (ed.): *Tybrind Vig: Submerged Mesolithic Settlements in Denmark*. Jysk Arkæologisk Selskab, Højbjerg, p. 363-365.

Reitz, Elisabeth J. and Wing, Elizabeth S. 2008: *Zooarchaeology* (2nd ed.). Cambridge University Press, Cambridge.

Richter, Jane and Noe-Nygaard, Nanna 2003: "A Late Mesolithic Hunting Station at Agernæs, Fyn, Denmark: Differentiation and Specialization in the late Ertebølle Culture, heralding the Introduction of Agriculture?" *Acta Archaeologica* 74:1, p. 1-64.

Richter, Jane 2005: "Selective hunting of pine marten, Martes martes, in Late Mesolithic Denmark." *Journal of Archaeological Science* 32:8, p. 1223–1231. DOI: 10.1016/j.jas.2005.03.005.

Rowley-Conwy, Peter 1995: "Meat, Furs and Skins: Mesolithic Animal Bones from Ringkloster, a Seasonal Hunting Camp in Jutland." *Journal of Danish Archaeology* 12:1, p. 87-98.

Russell, Nerissa 2012: *Social zooarchaeology: humans and animals in prehistory*. Cambridge University Press, Cambridge.

Sheehy, Emma et al. 2014: "A non-invasive approach to determining pine marten abundance and predation." *European Journal of Wildlife Research* 60, p. 223–236. DOI: 10.1007/s10344-013-0771-2.

Singer, Peter 2015: *Animal liberation*. 40th anniversary edition. The Bodley Head, London.

Sommer, Robert and Benecke, Norbert 2004: "Late- and Post-Glacial history of the Mustelidae in Europe." *Mammal Rev*. 34:4, p. 249–284. DOI: 10.1111/j.1365-2907.2004.00043.x.

Steffen, Martina L. 2023: "Can transport costs explain the near absence of marmot bones at shoreline archaeological sites on Vancouver Island? Finding input values for central place modelling with biological scaling." *Journal of Archaeological Science* 150. DOI: 10.1016/j.jas.2023.105725.

Strid, Lena 2000: *To eat or not to eat? The Significance of the Cutmarks on the Bones from wild canids, mustelids and felids from the Danish Ertebølle site Hjerk Nor.* Master's Thesis: University of Southampton.

Trolle, Tine 2013: "Human and animal bones from Tybrind Vig." Søren H. Andersen (ed.): *Tybrind Vig: Submerged Mesolithic Settlements in Denmark*. Jysk Arkæologisk Selskab, Højbjerg, p. 413- 498.

Trolle-Lassen, Tine 1986: "Human Exploitation of the Pine Marten (Martes mates (L)) at the Late Mesolithic Settlement of Tybrind Vig in Western Funen." *Striae* 24, p. 119-124.

Trolle-Lassen, Tine 1987: "Human exploitation of fur animals in Mesolithic Denmark." *Archaeozoologia*, I:2, p. 85–102.

Trolle-Lassen, Tine 1990: "Butchering of Red Deer (Cervus elaphus L.)—A Case Study from the Late Mesolithic Settlement of Tybrind Vig, Denmark." *Journal of Danish Archaeology* 9, p. 7–37.

Watanabe, Shigeru 2013: "Animal Aesthetics from the Perspective of Comparative Cognition." Shigeru Watanabe and Stan Kuczaj (ed.). *Emotions of animals and humans: comparative perspectives*. Springer, p. 129-164.

Weil, Kari 2010: "A Report on the Animal Turn." *Differences,* 21:2, p. 1–23. DOI: 10.1215/10407391-2010-001.

Wilson, Bob 1992: "Considerations for the identification of ritual deposits of animal bones in Iron Age pits." *International Journal of Osteoarchaeology* 2, p. 341– 349. DOI: 10.1002/oa.1390020411.

Wendrich, Willleke Z. 2021: "Fowler, C. 2004. The archaeology of personhood. An anthropological approach. London/New York, Routledge." *PalArch's Journal of Archaeology of Egypt / Egyptology* 3:1, p. 1-2.

Zalewski, Andrzej and Jedrzejewski, Wlodzimierz 2006: "Spatial organisation and dynamics of the pine marten Martes martes population in Bialowieza Forest (E. Poland) compared with other European woodlands." *Ecography* 29, p. 31–43. DOI: 10.1111/j.2005.0906-7590.04313.x.

Dansk resume

Meningsfulde mesolitiske mår?

En multispecies-revurdering af skovmårlevnene fra Tybrind Vig

Denne artikel genbesøger de arkæologiske levn af skovmår (*martes martes*) på den ikoniske jægerstenalderboplads Tybrind Vig på Vestfyn. På denne lokalitet er mindst 29 skovmårindivider blevet flået og deponeret i fire afgrænsede bunker. Disse levn er i den oprindelige litteratur blevet tolket som intensiv pelsjagt og efterfølgende affaldsbortskaffelse. Vi argumenterer for, at det arkæologiske materiale tillader andet og mere end denne udelukkende økonomiske tolkning; den særlige deponering af skovmårlevnene i bunker indikerer en struktureret, intentionel og potentielt meningsfuld praksis. Vi drager etnografiske paralleller fra præindustrielle samfund, hvor skovmårjagt er uløseligt forbundet med en forståelse for dyreartens adfærdsmønstre og en essentiel respekt for skovmåren, der kendetegnes ved sin intelligens og smidighed. Artiklen foreslår dermed at tolkningen af skovmårlevnene fra Tybrind Vig som værende evidens for intensiv pelsjagt afspejler en moderne, industriel tankegang. Til

denne tolkning tilføjer vi en teoretisk motiveret og etnografisk baseret forståelse af skovmår-menneskerelationerne for ca. 6000 år siden som indebærer et afhængighedsforhold, der både er præget af mere komplekse, sociale, og morale interaktioner. Artiklen bidrager dermed til en kontinuerlig reevaluering af dyre-menneskeforhold på tværs af tid.