

HUMANS AND THEIR RELATIONSHIP TO LARGE CARNIVORES IN CENTRAL EUROPE FROM FORAGERS TO MODERN TIMES: A SURVEY

Through the whole history of mankind, the relationship between humans and large carnivores was a mixture of fascination and dread. They were admired and feared, cosseted and killed (Kruuk 2002). Even if such emotions are not tangible in archaeological remains, there are several possibilities to prove the humans view on these animals, e. g. the presence (and also absence) of skeletons of carnivores or traces on their bones made by man. The scientific discipline taking a holistic view on the interactions between humans and animals in the past is named Social Archaeozoology or Social Zooarchaeology (Russell 2012). It does not only focus on archaeological data such as remains of animals, but includes also results of ethnographic studies in the investigations as well as analyses of depictions and of written sources. An understanding of all facets of relationships between animals and humans needs the cooperation of many different scientific disciplines, and consequently a comprehensive volume about this topic includes perspectives from zoology, ethnology, neuropsychology, developmental psychology, human medicine, sociology, jurisprudence, cultural sciences, philosophy, theology, and history (Otterstedt/Rosenberger 2012). An approach similar to the mentioned volume would also be necessary to tell a complete story about the relation between humans and large carnivores in prehistoric and historic times. Combined together, these sources provide detailed information about the status, prestige and reputation of carnivores and show that they have played numerous roles in past human societies: companions, helpers, diet, sacrificial victims, scary manifestations of »the evil«, objects of taboos and more (Russell 2012).

Especially the interactions between humans and carnivores – this name includes canids, felids, hyaenids, and ursids – during the Ice Age are in focus of scientific research since decades (summarised in Rosell et al. 2012). Direct records of carnivores such as bones or indirect evidence for their presence like remains of their prey are known from many campsites of Ice Age people. In most cases this close spatial contact was possible because humans and carnivores alternated in using the same sheltered caves or dens (Turner 1992). Potentially, contacts of humans and large carnivores often originated in visits of carrion-feeding predators in shelters where humans had stored their meat (Rosell/Blasco 2009).

Until the Ice Age a kind of coevolution between carnivores and humans can be observed (Brantingham 1998; Stiner 2002; Schleidt/Shalter 2003). At the end of such a process at least between wolves and humans a coexistence developed. Probably via the step of commensalism this coexistence resulted in the first domestication of an animal species in human history.

Most of the Ice Age carnivores are extinct today: sabertooth cat (*Smilodon fatalis*), cave lion (*Panthera spelaea*) and cave bear (*Ursus spelaeus*) disappeared already before the Ice Age ended (Stuart/Lister 2011; Diedrich 2014; Stuart 2015). The spotted hyaena (*Crocuta crocuta*), widely distributed in Africa, was also part of the European fauna during the Ice Age, but extinct there 30 000 years ago at the latest (Stuart/Lister 2014).

The present paper focuses on the last 15 000 years, i. e. the Holocene, the time since the ending of the last Ice Age. The geographical emphasis will be Central Europe and in some parts also Scandinavia. In this area

during the Holocene only four larger carnivore mammals shared the same habitat with humans: brown bear (*Ursus arctos*), wolf (*Canis lupus*), lynx (*Lynx lynx*), and wildcat (*Felis silvestris*). Others, such as leopards (*Panthera pardus*), tigers (*Panthera tigris*) and lions (*Panthera leo*) also reached Europe, but did not occur in areas north of the Balkans and the Ukraine (Sommer/Benecke 2006). Consequently, the relationships between those large cats and humans will be excluded, particularly because several overviews about this topic are available (Yannouli 2003; Thomas 2004; Bartosiewicz 2009; Thomas 2014).

Additionally to bear, wolf, lynx and wildcat two more animals are included into the present study: the domesticated forms of wolf and wildcat. The questions for the ancestors of domestic cats and dogs and for the process of domestication have been clarified by intensive research of anatomists and archaeozoologists (Bökönyi 1974; Herre/Röhrs 1990; Hemmer 1990; Benecke 1994; Clutton-Brock 1999), and their results were nowadays complemented by analysis of ancient DNA in bone remains and by population genetics. In the case of these two animals we briefly summarise the domestication process and then describe the ways of utilising dog and cat in the past. The utilisation of dogs and cats but also their reputation have changed over times and cultures, and this circumstance offers quite deep insights into the relationship and co-existence of man and wild or tamed carnivores.

Several aspects in the present article origin from research of the research focus »History of Hunting and Fishing« at the Centre of Baltic and Scandinavian Archaeology (ZBSA) located in Schleswig/D. This focus includes research projects covering mainly the area between the northern Atlantic and the Ural Mountains and the periods from Late Palaeolithic to the Middle Ages. The ZBSA projects include and combine a large variety of methods used both by arts and sciences (Grimm/Schmölcke 2013; Grimm et al. 2014).

The idea of the present paper is rather to give a short overview about the state of research, complemented by results of recent investigations. Primary and secondary written and pictorial sources, but also finds of weapons and bones are so numerous that their evaluation must be the task of comprehensive volumes (Paul 1981; Kruuk 2002; Fascione/Delach/Smith 2002; Bieder 2005; Kalb 2007; Faure/Kitchener 2009; Brunner 2010; Kindler 2012; Turner/Bateson 2014). Especially considerable is the literature about human/dog relationships, and this field of research in particular can only be touched briefly here (for further information see Crockford 2010 and Morey 2010).

RELATIONS OF FORAGERS AND FIRST FARMERS TO LARGE CARNIVORES

During the Mesolithic, which stretches by definition the cultures and time between the end of the Ice Age and the beginning of farming, human diet was based on hunting, fishing, and gathering, similar to the preceding Ice Age. In the successively forested Central European landscape people lived in temporary settlements and mobile dwellings, probably different kinds of tents (Wenzel 2009). One of the archaeologically best investigated areas of the Central European Mesolithic is the region around the Mecklenburg Bay of the Baltic Sea in northern Germany. Between 1995 and 2005 a series of settlements uncovering hundreds of well-preserved animal remains have been excavated there (Hartz et al. 2014). The c. 1500 mammal bones, 750 from Mesolithic and Neolithic each, are not only a suitable basis for reflections about the relationship between humans and carnivores during the Mesolithic, but also for the development of Stone Age hunting strategies in general (Hartz/Schmölcke 2013). Such analysis shows that in the region around the Mecklenburg Bay the people from the Mesolithic hunter-fisher-gatherer cultures mainly exploited red deer (*Cervus elaphus*), wild boar (*Sus scrofa*), aurochs (*Bos primigenius*) and roe deer (*Capreolus capreolus*); from these species derive more than 90 % of animal bones found at human settlements. Apart from such game species

also remains of fur-bearing species such as beaver (*Castor fiber*), otter (*Lutra lutra*) and other mustelids are recorded, and sometimes also sealing played a role. But the most relevant aspect for the present paper is that from terrestrial carnivores not a single remain larger than from red fox (*Vulpes vulpes*) was found.

This regional example of animal exploitation during the Mesolithic can be generalised, since remains of large carnivores are commonly exceptional in bone assemblages from European human settlements of the very period (Charles 1997). Although there is no doubt that wolf, brown bear and wildcat were distributed over all parts of Central Europe in that time, their remains are only scarcely found (Sommer/Benecke 2006). It has to be concluded that these species were no regular hunting prey for Mesolithic people. Even the fact that artificially perforated teeth from these carnivore species have been found repeatedly at Mesolithic sites in Central Europe is not contradictory. It just documents the use of teeth of large carnivores as an application of clothes, but such a practice is not unique to teeth of them but also known for teeth of other species (Gramsch 2014). Impressive and significant examples provides the Neolithic cemetery of Ostorf (city of Schwerin/D), where in several human graves necklaces have been found combining hundreds of single teeth of bear and wildcat, but also of smaller carnivores such as badger, otter, pine marten, red fox, and dog, as well as of red deer (Lehmkuhl 2010).

To summarise these data, in Central European hunter-gatherer societies carnivores probably played neither a role as a hunting trophy nor were they considered as food competitors. Potentially, during the Mesolithic time humans and large carnivores avoided direct contact to each other. Alternative explanations for the scarcity of records could be found in the small population density of predators in contrast to herbivores, or hunting carnivores was too risky in comparison with the output, or there were spiritual reasons forbidding bear and wolf hunting.

In the 4th millennium BC with the beginning of the Neolithic, hunter-fisher-gatherer cultures in whole Central Europe were replaced step by step by cultures of farmers. After a time of transition, the new human diet based first and foremost on agriculture and husbandry with cattle, pigs, sheep and goats (Lüning 2000; Feeser et al. 2012). In our focus region around the Mecklenburg Bay besides Mesolithic camps also several Early Neolithic sites have been excavated (Hartz et al. 2014), and the analysis of the mammal remains unearthed there proves a mixed economy (Hartz/Schmölcke 2013): Although the subsistence of the people based mainly on domestic animals now, hunting was still an important part in the life of the first farming communities, and remains of wild mammals still account for 38 % of the bones. 89 % of the bones from wild animal species derive from red deer, again followed by roe deer, wild boar and aurochs. The remaining 11 % come from a long list of animals including brown bear as well as wolf and wildcat. In other parts of Central Europe also lynx can be added to this list of species occasionally hunted by the Stone Age farmers (Sommer/Benecke 2006). In contrast to the previous forager cultures, for the first farmers large carnivores seemingly had become a relatively common object of hunting. This result, which has supra-regional validity (Steffens 2005), may indicate a change in the overall tradition and motivation of hunting. Thanks to the presence and breed of livestock, hunting was not the central dietary source any longer, and as a consequence new, alternative hunting motives and reasons developed: religious, symbolic and ideological as objects of prestige (Boyle 2006; Hartz/Schmölcke 2013). The chase of carnivores was in those days probably mainly undertaken in order to protect the livestock. However, in spite of more intensive hunting of larger carnivorous species, the human pressure had no influence on their population size and distribution. Aside from isolated populations on islands, there is no evidence that the first farmers reduced the natural number of these animal species purposeful and effectively (Butzeck/Stubbe/Piechocki 1988; Sommer/Benecke 2005).



Fig. 1 Brown bears are the largest terrestrial carnivores in Holocene Europe. – (Photo Francis C. Franklin, European Brown Bear, CC BY-SA 3.0).

HUMANS AND BROWN BEAR

Prior to times of cultures with written sources or depictions it is difficult to reconstruct the perception of the largest Central European predator, the brown bear (**fig. 1**), and the general relationships between bear and man. It is only after such archaeological and historical sources complement the bone assemblages our knowledge of the human/bear-relationship increases (see Schmölcke/Groß/Nikulina 2017 for many examples). Generally, the typically very small number of brown bear remains in European archaeological bone assemblages in the whole period between Stone Age and medieval times demonstrates that bears played a minor role as an object of hunting over millennia. This observation is in contrast to the value of brown bear meat, which contains more calories per kilogram than all other terrestrial mammals available for the people (U.S. Department of Agriculture 2016). Probably, the minor relevance of bear meat is connected to their low population density, but surely also to the fact that hunting bears is widely known as a highly dangerous and risky undertaking. The risk in meeting bears is also mirrored in their name in the Germanic languages, since the English *bear*, the Scandinavian *björn* or the German *Bär* root in the old **bher-* or **bheros*, originally meaning just »brown« (Pokorny 1959). Using such an indirect name is common when the actual name of an object is a taboo. By calling the species »the brown one« the people avoid to call up the potentially dangerous animal (Kluge/von Seebold 2012). A similar use of euphemisms for the bear is known in Slavonic languages, where the name for bear goes back to verbatim »honey eater« (e. g. Russian медведь, Ukrainian ведмідь, Polish *niedźwiedź*; see for instance Černych 1999, 781-782). For different peoples in Siberia the bear is either »the old man« or »the grandfather« (Duerr 2010, 73).

Even if there was no relevant economic interest of Stone Age to Early Iron Age people in bears as a meat resource, in spiritual and religious realms, however, the things might have been very different. Many native people of the north of Europe, Asia, and America admire the brown bear as a kind of mediator between animals and humans until modern times, and for that reason they normally did not kill them. Often it was only allowed to hunt a bear after performing strict and complex rituals before and after the hunt (Duerr 2010, 76 ff.; Wamers 2015). Much could be said about bear symbolism, about the meaning and reputation of the species in the past (Schmölcke/Groß/Nikulina 2017). In the present paper only two widely unknown fassets should be mentioned: In several cultures bear hunting became an ideological context in the course of time with high prestige, and bears became »the hero's enemy« (Oehrl 2013). As S. Oehrl has described and analysed in a comprehensive paper about this topic, from late antiquity onward bear hunting was regarded as a particularly heroic deed, demanding great courage and earned the hunter glory. Following Oehrl's detailed explanation the roots of this motif go back to the 2nd century AD, the reign of Roman Emperor Hadrian. The so-called Arch of Constantine in Rome, originally dedicated to Hadrian, for instance, shows the depiction of a bear hunt among others, and for this Emperor the symbolic significance of his personal success in hunting bears was so important that he even coined money with the bear as a motif. From Hadrian's time to the Middle Ages, brown bears became prestigious hunting trophies, insignia of heroes with an extraordinary deed of courage.

Contemporaneously to this development, in northern and eastern Central Europe, but especially in Scandinavia another tradition can be observed, potentially arising independently: from the last centuries BC until the Christianisation in this region (dating regionally different, starting about AD 300 and ending about AD 1000) in human graves remains of bear appeared quite regularly (fig. 2). These remains are often claws, which might indicate the former presence of a bearskin under the dead person, in some cases even skins are preserved (Grimm 2013, fig. 1). In total more than 400 burials with bear-related furnishings dated to the 1st millennium AD are known from Scandinavia, and at least 100 in Central Europe, so this tradition became almost a »mass phenomenon« (Grimm 2013). As O. Grimm has demonstrated in his thorough review of this feature, human graves with bear remains have a marked concentration in mid-east Sweden, and in particular their frequent presence at Gotland in the Baltic Sea is remarkable. Since brown bears did not occur on this island, their remains on Gotland reflect regional fur and skin trade (Petré 1980). A second contemporaneous regional concentration of human graves with bear skins was western Norway; in this area the distribution is strongly linked in time and space to changing traditions of the burial rite (inhumation burials versus urns) and favourable preservation conditions. Most of the Norwegian burials belong to persons of

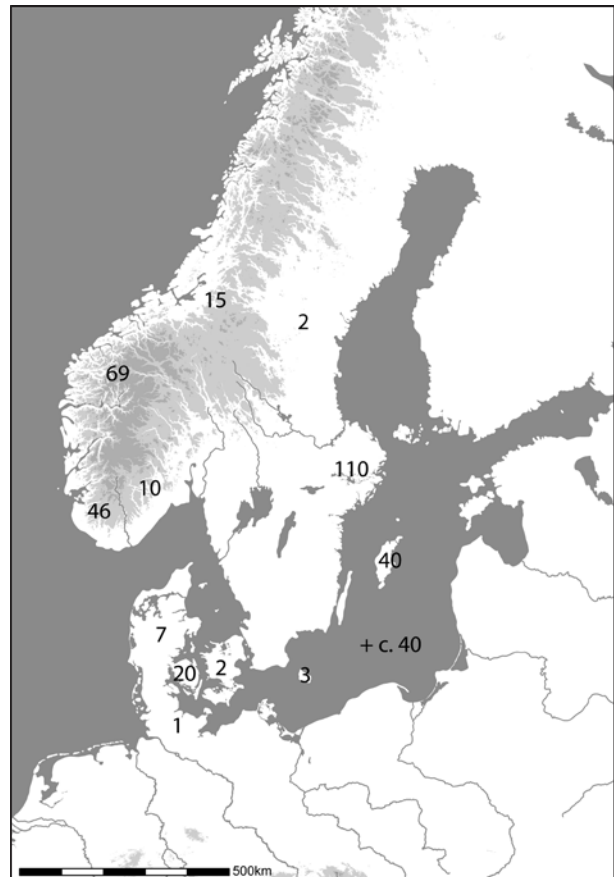


Fig. 2 Distribution map of human graves with skins or claws of bear. All graves dated to the 1st millennium AD. – (Changed after Grimm 2013, figs 2. 5).

high social rank, both men and women. As O. Grimm pointed out, the oldest known graves with bear-skins in Norway as well as in Sweden are those of women. It is remarkable that the richest known graves from the mid of the 1st millennium AD in Scandinavia contained skins, whereas in other cases, only single sometimes perforated claws or bear-tooth have been put in the grave.

The meaning and the background of this burial tradition is still under discussion. Potentially, these graves were burials of bear-fighters, and this suggestion is supported by pictorial sources, in which the bear-fighter motif is quite popular during the 1st millennium AD in the centuries in question (Wamers 2009). However, the frequency of female graves with bear furnishing in particular raise doubts about a strong connection between successful bear hunters and such grave goods (Grimm 2013). An alternative explanation is given by S. Oehrl (2013): It could have been the husband of the dead woman who gave her his most valuable hunting trophy into the grave to demonstrate the rulers of the afterlife that the deceased was the wife of a hero. After Christianisation the image of bears changed and in the imaginary of the people bears shifted from powerful and respected kings of the woods to redoubtable »beasts« with a close connection to the devil (Molsdorf 1926, 133). Potentially for the purpose of making the devil tamed and conquered, in medieval times the practice of dancing bears spread over Europe (Bieder 2005; Brunner 2010, 139-146). Already during the Middle Ages bears were also kept in special bear-pits as attractions (Hauck 1963; Butzeck/Stubbe/Piechocki 1988). In those times, at least in parts of Central Europe the people were obligated by the authorities to kill every single bear, if possible, and after registration the hunter was allowed to keep the dead bear (Lindner 1940).

The increasing hunting pressure, but also the intensive medieval forest cleaning in the course of the growing human population density fragmented the distribution range of brown bears in Central Europe (Müller 1971; Butzeck/Stubbe/Piechocki 1988; Benecke 2000). Originally occurring throughout Europe, with the exception of some islands, they disappeared in the course of the last millennium from many areas. However, in most parts of Europe it was not until the 19th century that bear populations declined dramatically (Huber/Swenson in: Deinet et al. 2013). Today the total number of brown bears in Europe increased again and amounts about 17 000 animals added by more than 10 000 in the European part of Russia. This recent development is the result of the youngest change in the human/bear-relationship (presented e. g. by Kalb 2007 and especially obvious in Bürglin 2015).

HISTORY OF DOMESTIC DOGS AND HUMAN RELATIONSHIP TO WOLVES

Wolves (*Canis lupus*; **fig. 3**), in former times widespread in the northern hemisphere, were the first domesticated animals in human history. Due to anatomical and ethnological studies at the end of the 20th century there was no doubt any more that this species is the only ancestor of the dog (summarised in Herre/Röhrs 1990; Clutton-Brock 1995). In the meantime phylogenetic studies have verified this result (Vilà et al. 1997; Vilà/Maldonado/Wayne 1999; Wayne/Ostrander 1999). As very intensive research during the last decade shows, the process of domestication took place independently at different places at least in the Near East, in Siberia, China, and Europe between 32 000 and 14 000 years ago (e. g. Germonpré et al. 2009; Larson et al. 2012; Thalmann et al. 2013; Morey 2014; Skoglund et al. 2015; Wang et al. 2016).

One of the oldest dog skeletons known so far has been found associated with a Late Palaeolithic double burial at Bonn-Oberkassel in western Germany; it is approximately 13 500 years old (Nobis 1986; Street 2002). In this case members of a Late Glacial population of *Homo sapiens* have buried a canid next to a human couple. The fact that one of the oldest securely identified dogs is also the oldest known dog burial un-

Fig. 3 For the longest time of the Holocene wolves were widely distributed in most parts of Europe. – (Photo G. Kramer, U.S. Fish and Wildlife Service).



derlines impressively the emotional significance of dogs already in early stages of domestication. Obviously, with the domestication a strong social relationship between dogs and people developed. From that time on dog burials became a worldwide phenomenon until today (Wiedemann 2002), and some archaeological sites contain hundreds or even over one thousand buried dogs (Morey 2006, tab. 1).

Based on these features, but also because of finds of scattered dog remains in settlement contexts it is possible to reconstructed several details about Stone Age dogs: measurements of bones allow for instance the reconstruction of size (Benecke 1987; 1994; Morey 1992), and the diet of the animals is reflected in the stable isotope composition of their remains (Ewersen et al. 2018). However, it is difficult to determine the main functions of the earliest dogs (Horard-Herbin/Tresset/Vigne 2014, tab. 3), since no written or pictorial sources are available from this period of time. Archaeozoological studies can find evidence if dogs were used as food or for fur or as religious symbols and emotional objects, but they cannot answer the question if these dogs were also hunting assistances, herder, guards, labourer or bed-warmer (Manwell/Baker 1984; Russell 2012, 279-296). From Central Europe features and indications for nearly all these functions can be collected, showing a complex picture with dogs as beloved partners as well as regular food resource (Vang Petersen 2013; Ewersen/Ramminger 2013). From our modern Central European point of view the latter



Fig. 4 Influenced by the developed level of Roman dog breeding the variability in size was also high the Germanic area. In this example of tibiae from adult dogs from Feddersen Wierde (Lkr. Cuxhaven/D), the left bone origins from an about 27 cm high dog, the right one from a dog of about 70 cm shoulder height. – (Photo U. Schmölcke).

function of dogs seems to be hard to believe, but factual the purposeful production and use of dog meat was common in some southern German cities until the first half of the 20th century (Geppert 1990). Not to mention living traditions in other parts of the world as in South Korea, where dog meat is after pork, beef, and chicken the fourth most-consumed meat today (Kim 2007; von Chamier 2017).

Without any question, in the Central European Stone Age hunter-gatherer community dogs were not only animals for production, but had also the status as valued companions at the same time. Particularly well-preserved burials of dogs from Mesolithic sites in Denmark and Sweden, but also in the Balkan area emphasise the social importance of these animals and potentially they point to a special role as people's helper also in the afterlife (Vang Petersen 2013). With a view on the presence of dogs in human graves, e. g. at the Swedish site Skateholm (Skåne län/S; Larsson 1990; Fahlander 2008) and the ethnographic record it has been suggested that dogs had a semi-human status at least in some Scandinavian Mesolithic cultures (Tilley 1996, 35). The buried dogs were thus interpreted as substitutions for missed humans, as animal shamans, as symbolic watchdogs or dear members of the household (for detailed discussion see Fahlander 2008; Morey 2006).

In Central Europe and southern Scandinavia, comparisons of the size of carnassial teeth of Mesolithic dogs and wolves have shown that the shoulder height which is about 80 cm in wolves was only 50 cm in mean in dogs (Benecke 1994). This body size was consistent for a long time in many parts of Europe. In Old Egypt, however, and later in ancient Greece and Rome special types of dogs were bred including small pets, dogs similar to modern sighthounds and large, strong and aggressive variances (Peters 1997; Schmölcke

2013). Influenced by the Romans, about 2000 years ago a higher variability in size and stature in dogs developed also in Central Europe. The majority of the Germanic dogs, however, still reached shoulder heights of about 50 cm, but the Roman provinces along Rhine and Danube were an exception. Nearly each excavated settlement in this area derives remains from adult dogs of very short stature, with shoulder heights less than 30 cm, sometimes less than 20 cm (fig. 4). This record is in accordance with written sources which also mention such small animals as toy dogs (Peters 1997). In the Roman parts of Central Europe 2000 years ago the phenotypical differentiation in dogs was so distinctive that a pre-stage of selective breeds could be expected (Benecke 1994). With the end of the Roman culture about AD 400 the high variability of dogs came to an end. In the subsequent period the dogs were again less varied in size and stature.

In the Middle Age the large majority of dogs had a size similar to the Mesolithic dogs and comparable to modern feral street dogs. In practise of dog breeding the people conducted for a long time a choice for utilisation: out of the whole individual variability within a local dog population, special types have been preferred for hunting, herding, or as watchdogs. Until modern times, there is no evidence for a purposeful development of special dog breeds in Central Europe.

Between 500 BC and AD 400 dogs were buried regularly in large parts of Europe (Makiewicz 2003). Since many similar cultural features at this time can be observed from Denmark over Germany, Poland and Czechia to Romania and Moldavia (Prummel 1992; Makiewicz 2003), one can conclude that the tradition to bury dogs was known in the whole area east of the Roman Empire. In nearly all cases these dogs were deposited in connection with buildings or between houses, anyhow inside the human settlements (fig. 5). Therefore, the dog's symbolic role as guards of the houses is obvious (fig. 6). However, interestingly the age of such building sacrifice dogs ranges from young puppies to very old animals, so it was not the real power or watch-

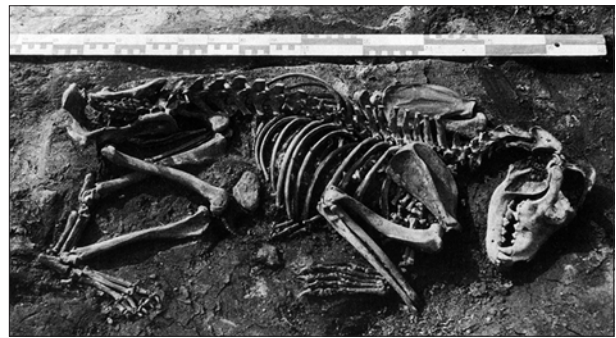


Fig. 5 During the 1st half of the 1st millennium AD burials of dogs in the entrance of houses or between buildings were very common in many parts of Central and Eastern Europe. Feddersen Wierde. – (Photo U. Schmölcke).



Fig. 6 Detail of the dog from fig. 5. The forehead of the dog is destroyed, potentially by an intentional killing. In this case the dog would be a regular offer. From afterlife, he has to be an »eternal« guard for the owner's house. – (Photo U. Schmölcke).



Fig. 7 In the 2nd half of the 1st millennium AD it was popular in Northern Europe to be buried together with pets and tamed raptors. 7th-century grave from Rickeby (Uppland/S). – (For details see Vretemark 2013; drawing U. Malmsteen).

fulness of the dogs but their symbolic role, which is reflected in such burials (Makiewicz 2003).

About AD 500 this tradition ended and dog skeletons disappeared from settlement contexts. Instead of this, dogs became now part of prestigious grave gifts (Prummel 1992). This new practice can be observed in Central Europe as well as in Sweden and demonstrates a strong connection between single dogs and the social prestige of their owner (fig. 7). These dogs were larger than the population's average, and this is especially true for Scandinavia, where often large dogs of 60-70 cm high have been buried. Potentially these animals were strong hunting dogs, because other hunting equipment is commonly also part of the grave gift (Makiewicz 2003; Schmölcke 2013). Records of huge dogs as well as written sources show that in

those days a sporadic but purposeful introgression of wolves cannot be excluded (Benecke 1994, 175). Even if the large buried dogs were connected with and certainly an element of aristocratic horseback hunting, they also occur frequently in ordinary graves (Prummel 1992). Moreover, graves with a dog combined with one or more horses or a second dog are also known (Makiewicz 2003).

It can be summarised that dogs played definitely an important role for Germanics as a partner in the afterlife (Prummel 1992; Makiewicz 2003; Gräslund 2004; Scheibner 2012). Written sources, which exist in Central and Northern Europe for this period in addition to archaeological sources, reflect further facets of human's emotional life and allow us to understand at least in parts the background of the dog burial rite: they clearly show a strong connection between the dog and the death. In this connection the mythical dog was recognised as a medium between the living and the dead (Gräslund 2004). This belief was long-lasting in some parts of Europe and still known even in modern times (Lurker 1983).

It should not go unmentioned, however, that besides the spiritual significance most dogs were animals of everyday life, and this include a large variety of functions and could also comprise the use of dogs as a meat-producing animal and of the dog's pelt (Ewersen 2010).

In comparison to the Iron Age, the role of the dog changed again after Christianisation. It was still connected to the social prestige of the elite, particularly knights, but now explicitly as a valuable hunting animal and not a spiritual companion anymore (Makiewicz 2003; Schmölcke 2013). Naturally, such a high appreciation (fig. 8) was again aimed to a minority of dogs only (Grieve 2012). An exemplary study on dog remains from Anglo-Saxonian sites demonstrates that the large majority of dogs had hard lives (Crabtree 2015). Serving as guard and herders and involved in hunting and fighting most of the animals died relatively young and with numerous injuries and pathologies.

In the medieval Christian cultures it was not allowed anymore to bury animals in hallowed grounds, and consequently no dog skeletons can be found at cemeteries anymore. Only very few exceptional cases are known so far. Such an interesting feature is a grave excavated outside a cemetery of the 11th century at Visegrád-Vákert in Hungary (Kom. Pest/H; Vörös 1990). Here, a single female was buried in distance to all other people, and she was surrounded by six dogs. This special feature resulted in the interpretation of a »grave of a witch«. Even if we have no regular dog graves, there is a quite frequent appearance of dogs in early medieval Christian iconography and written sources, demonstrating a complex symbolic role of this

Fig. 8 In medieval times, valuable hunting dogs of the nobility were medicated and nursed. From: Gaston Phoebus. *Livre de la Chasse* (1387-1389). Paris, Bibliothèque National de France, Département des manuscrits, ms. Fr. 616, fol. 40^v. – (agk-images, AKG357707).



species in the sacral space (Bartosiewicz 2012) as well as a rhetorical image for religious polemics (Resnick 2013).

Such a bond and level of communion observed globally between humans and dogs is unique in human-animal relationships. However, it is also true that the roles of dogs always range »from the venerated to the impure, from the tolerated to the loved« (Reece 2005, 63) – similar to today, in particular if taken in mind the situation of the feral street dogs in developing countries (Reece 2005). Always only a minority of dogs is and was handled like a companion, but large parts of the dog population lived in prehistoric and historic times on the bottom fringe of the human society and still do it today (Serpell 1995).

Returning to the relationship between the wild ancestors of dogs, wolves, and humans, we can carry forward the data and conclusions from Mesolithic and Neolithic times generally. Even if the number of sites with records of wolves and the frequency of their bones increase slightly after the change of human lifestyle from hunting-fishing-gathering to farming (Aaris-Sørensen 1977), bones of wolves remain rare in archaeological assemblages until the Early Middle Ages. Since this a supra-regional phenomenon to observe for instance in Britain, Central Europe and Scandinavia – regions, where wolves definitely occur until modern times –, some years ago a well-known archaeozoological publication was titled »Where are the Wolves?« (Pluskowski 2006a). Pluskowski's comparative study comes to the result that the limited presence of wolf remains can be explained with both infrequent hunting and the limited value of wolf's fur in relation to other fur-bearing animals. There is some evidence from Scandinavia that during the 1st millennium AD the Vikings hunted wolves for fur, but in comparison to species such as beaver, otter or small martens the wolf was of minor importance (Wigh 2001). Contemporaneous depictions show that the wolf's pelt was probably used mainly for mumming in magic and martial contexts (fig. 9; see Price 2016). This kind of symbolism is associated with early medieval Scandinavian poetry, which repeatedly praises great warriors as »feeders of the wolves«. Such title reflects the behaviour of wolves to appear on battlefields after the end of the fight



Fig. 9 Even if wolf pelts are not of exciting quality they have been used for coats until modern times. Picture from Umeå, Sweden, 1897. – (Photo S. Klingspor, Nordiska museet, Två män i vadlänga pälsar, Umeå, 1897 NMA.0041364).

to feast on dead soldiers (Hiltmann 2013). Based on this observation in Norse mythology wolves are mainly attributed as »producers of disorder«, but in general the picture was complex with both negative and positive connotations (Hiltmann 2013 with many details). With Fenrir, an artful opponent of the gods, and Geri and Freki, Odin’s escort, this contrariness is reflected in very different roles in the Norse mythology (Simek 2006).

After Christianisation the reputation of wolves varied across Europe, but in particular in Central Europe the wolf became an allegory of bad qualities, and in medieval Christian literature wolves were commonly used as a metaphor for vice (Pluskowski 2006b). This perspective encouraged the people’s motivation to kill wolves and ended not until the species was completely exterminated in this area. The reduction and ultimately extirpation of this species was official aim of the authorities in many parts of Central Europe. Often justified by the religious connotation it can be shown that at least in some regions wolf hunting was de facto driven by a completely different motif namely the wolf’s disruption to the hunting culture of the nobleman (Pluskowski 2006b).

When the population density of wolves increased significantly during and after the Thirty Years’ War (1618-1648), wolf hunting was intensified and officially labelled as a public duty (**fig. 10**). The official order to kill every wolf sighted was not directed because they were regarded to be dangerous for people, but because of the strong damage they made in dispatching domestic animals, in particular horses, which were of high importance as draught animals in that days (e. g. Jessen 1958; Sommer 1999). Motivated by official bounties to shoot animals and due to the purposeful destruction of nurseries of the wolves it took only 100 years to decimate the wolf population massively and only 50 more years to extirpate the species in Central Europe. Since the middle of the 19th century – now in a land without wolves – a romanticized rehabilitation occurred step by step with wolves as symbols for fidelity being the »kings of the forests« (Zimen 1978).

DOMESTICATION AND SOCIAL STATUS OF CATS

Not only today, but also in the past and at all continents humans built close relationships with felids: about 40 % of the felid species have been tamed over the millennia and in most cases the people encouraged commensal species, which had been attracted either by rodent pests or scavenging opportunities (Faure/Kitchener 2009). However, only one species was fully domesticated, probably in ancient Egypt: *Felis silvestris*, the wildcat, a highly adaptable species living in different varieties in most parts of Africa and in Eurasia from Europe to China and India (Driscoll et al. 2007). The domesticated variety, *Felis silvestris lybica*,

Fig. 10 Pit for hunting wolves build in the 17th century. Near Hohenwart (Lkr. Pfaffenhofen an der Ilm/D). – (Photo Georg Waßmuth, Wolfsgrube im Wald bei Hohenwart, CC BY-SA 3.0).



occurs in Africa and southwestern Asia. Thereby the domestic cat is in contrast to the dog a foreign faunal element in Central Europe, imported by humans.

Although present in all parts of the area since the Late Glacial, wildcats and the other European felid species, lynxes, rank among the rarest species recordable in archaeological animal bone assemblages. This applies not only for Mesolithic or Neolithic times, but also for younger periods. Obviously, both species were not hunted frequently and regularly, even if their dense winter skin was surely always a valuable resource. Due to their covert and cautious way of life and their small population density, hunting or trapping wildcats potentially had more to do with the demonstration of one's ability and with hunter's prestige (Schmitzberger 2009). Even at special purpose sites focusing on the exploitation or trading of fur bearing mammals, remains of wildcats are missing or very rare (for discussion and about the few contrary examples see Trolle-Lassen 1987; Wigh 2001, 121 ff.; Enghoff 2011, 293-298; Schmölcke/Nikulina 2015). However, convincing evidence for the human exploitation of wildcat during the Central European Stone Age only comes from the Danish Ertebølle (Nordjylland/DK), the final part of the northern Mesolithic. Particularly the site Hjerl Nor (Hjortholm/DK) yielded not only high quantities of bones from several fur bearing species, but also a large amount of remains from wildcat. A microscopic analyses of presence, number and placing of cutmarks on these bones shows that at this site besides fur also the meat of the animals was utilized regularly (Strid 2000). Traces of dismembering and filleting are characteristic and they occur in this assemblage at so many bones that eating of the wildcats is beyond doubt. However, since these special traces for the use of meat and marrow were not very desperate, humans did not use the meat intensively. Why the Stone Age people of Hjerl Nor were more interested in wildcats than people from other contemporaneous sites is difficult to explain. Hjerl Nor, however, does not change the general pattern of a subordinate relevance of the wildcat as a Stone Age hunting object.

The first evidence for a tamed cat comes from the location Khirokitia at Cyprus. 9300 years ago, a cat was buried there next to a man, on an island, where *Felis silvestris* has never occurred since the end of the Ice Age (Vigne et al. 2004). In particular the ritualistic position of the cat in the context of a human grave



Fig. 11 In Ancient Egyptian's Late Period (664-332 BC) an unknown artist created this about 40 cm high statue of a cat made of bronze with gold ornaments, the so called Gayer-Anderson Cat. It probably represents the goddess Bastet. She is also known as a woman with the head of a cat (Clutton-Brock 2000). – (Photo Einsamer Schütze, British Museum Egypt 101-black, CC BY-SA 3.0).

suggests a cultural importance of cats and a kind of spiritual connection of the owner to this special animal (Vigne et al. 2004).

It is plausible that cats participated actively in their own domestication, and that wildcats subsequently tolerated direct human presence from the time of Khirokitia onward (Lyons/Kurushima 2012). Potentially, for millennia commensal or tamed cats lived in association with humans, and probably this domestication process occurred in several regions independently (Bar-Oz/Weissbrod/Tsahar 2014; Hu et al. 2014; Montague et al. 2014).

In Egypt between 4000 and 3900 years ago during the 12th Dynasty people lived together with cats, and regular breeding seems to have been started some millennia later (Linseele/Van Neer/Hendrickx 2007; Kurushima et al. 2012; Van Neer et al. 2014). Cats played an important role in Egyptian spiritual life and in grave-like contexts a great number of mummified cats is known, so that ancient Egyptians could be regarded as »cat people« with cats as one of the most sacred animals (Morey 2006). The buried cats were larger than their wild ancestors, so they must have had very good living conditions. The high status and reputation of cats is impressively reflected in Bastet, the goddess of joy and dance, the protectress of pregnant women (fig. 11; Malek 1997; Schuller 2007). The Bastet cult likely began during the 22nd Dynasty (about 945-715 BC), and from the

writings of the Greek historian Herodotus we are well informed about all details of the ceremonies during the zenith of the cult in the 5th century BC (Serpell 2014).

However, this level of regard was a local Egyptian matter, and in ancient Greece and Rome cat did not play a prominent role. Tame wildcats or domestic cats were known in Greece since about 1400 BC and in Italy from 500 BC onwards (for details see Faure/Kitchener 2009). However, the spread of cats throughout the Mediterranean was slow, because ancient Egyptians forbade the export of cats (Faure/Kitchener 2009). It is remarkable that, following the iconography, in classical Greece cats were already used as pets (Malek 1997). Finally, attendant to the Romans, domestic cats also reached Central Europe during the first centuries AD (Benecke 1994, 145 ff.), but during the following centuries their bones remain always rare in archaeological assemblages from this area. A typical example for this time is Reric, today Groß Strömkendorf (Lkr. Nord-westmecklenburg/D), near Wismar in northern Germany, settled between AD 730 and 800, where from more than 25 000 bones from domesticated animal species only 19 cat remains have been found (0.08 %; Schmölcke 2004, 70 ff.). Only one to two centuries later, at the end of the 1st millennium AD, in one of the most important settlements of the Vikings, Hedeby (the beneficiary of Reric's destruction; Schmölcke 2004), bones of cats accounted already 0.4 % of the hundreds of thousands remains of domestic animals (Johansson/Hüster 1987; Heinrich 1996). It was after the year AD 1000 that cat remains in archaeological

Fig. 12 About 1618 in England the so-called Witches of Belvoir were three women, a mother and her two daughters, accused of witchcraft. Their cats were important attributes to them. – (The Wonderful Discoverie of the Witchcrafts of Margaret and Phillip Flower.... Together with the seuerall Examinations and Confessions of Anne Baker, Ioan Willimot, and Ellen Greene, Witches in Leicestershire [London 1619] 1).



assemblages from Central European settlements become rapidly and generally more frequent, potentially because large mice and rat populations in the growing towns provided rich dietary resources. An example for this development offers the border region between Germany and Denmark. In the medieval town of Schleswig (Kr. Schleswig-Flensburg/D), the successor of the directly neighboured Hedeby, cats have an account of 2.4 % of bones from domesticated animals – i. e. more than six times more than in Hedeby and 30 times more than in Reric some hundred years before (Heinrich 1996; Schmölcke 2004, fig. 47). In contrast to its ancestor Hedeby, in medieval Schleswig lived much more cats than dogs (Spahn 1986, 45). Surely, most of these cats were kept for mousing, but at least in some medieval towns this increase also coincides with increasing skinning records (Serjeantson 1989).

Based on multidisciplinary data, K. Poole has investigated the cat-human relationship between the 5th and the 11th century in detail (Poole 2014). He mentions different written sources showing that the people perceived mice-hunting as the function, duty or »job« of a cat and that successful and effective mousers could reach the same value as a woolly sheep with a lamb. The fact that at least some cats had a name shows that they were recognised as individuals with own specific character. However, at the same time cats were also seen as a source of fur, although it is not clear if they were killed purposeful or if they were found dead before skinned. Poole points out that in assemblages of animal remains from early medieval times cat remains with cutmarks are much more frequent on bones from young animals, indicating a preference for the fur of young cats. The reason for this might be the fact that young cat fur is softer. In Central Europe, for example at Hedeby, many cats also died at the age of nine to twelve months (Johansson/Hüster 1987). Thus, given a birth in spring, they died during their first winter. It could be suspected that these cats have been killed by humans to use their dense and soft winter pelts, but at Hedeby only single cat remains derive cutmarks. However, even if in this special case the age distribution probably reflects a high mortality of young cats due to underfeeding or diseases rather than direct human killing, this result is congruent with K. Poole's statement that in early medieval times many humans did not feed the cats regularly, to provide an incentive to mice hunting.

Latest about AD 1300 cats became to be regarded as »creatures of the devil« in large parts of Central Europe (Clutton-Brock 2000; Thomas 2005; von Heusinger 2007). Already for Hildegard of Bingen, cats were

toxic organisms (in *Physica* 7,26; written about AD 1150), and in the work *Opus de natura rerum* written by the medieval theologian Thomas of Cantimpré between 1225 and 1241 the cat epitomises several sinful features (Meier 2008, 62 ff.). Especially black cats were believed to be incarnations of evil, origin of plagues and accidents and companion of witches (fig. 12), and as a result cats were killed on a large scale. As a consequence, cats became so rare in Central European towns and villages that the populations of mice and rats increased rapidly in the course of the 14th century (Oeser 2004, 88-105; Hengerer 2009). Due to several facets of their behaviour – their demonstrative independency, their intraspecific intolerance, their nocturnal screeching – for many medieval people cats were not social beings such as dogs, but noticed as latent dangerous and antisocial. Cats »became a metaphor for female sexual depravity and social unruliness, and were persecuted and despised« (Serpell 2014, 100). Examinations of paintings and written sources show that their reputation only slowly changed (Hengerer 2007; 2009). However, there were also positive aspects in the relation between cats and humans: Since these animals were hold to be especially fertile and reproductive, they played a special role in matters of love. In parts of Europe a cat was a common wedding present, expressing the wish of many children for the newly married pair (Hengerer 2007).

It was only during the 19th century when cats started to become fashionable middle-class pets. Simultaneously the human attitude towards cats changed towards a predominantly positive view (Serpell 2014). In that days and today in large parts of Europe and North America cats have replaced dogs as the most popular animal species (Turner/Bateson 2014, tab. 1.1; Turner/Waiblinger/Fehlbaum 2014). However, even in Central Europe there are still people who connect to a sudden appearance of a black cat with bad luck, and others see them as furtive and untrustworthy (Serpell 2014). In contrast to dogs, even after millennia of domestication the cat behaviour still exhibits the biology of the wild ancestor.

CONCLUSIONS

In former human-carnivores relationships, the animals often had first and foremost a symbolic and non-rational significance. This factor can be demonstrated for the wild species bear and wolf, but also for dog and domestic cat. People connected several spiritual aspects with these animals, e. g. their relevance as co-workers and companions in life and afterlife, their role as agents between the here and the beyond or generally their position as mediators between humans and nature. In comparison to these aspects, connected to people's belief and their world of faith, more practical issues such as hunting assistance or mousing seem to have played a minor role. Surely, this was also important, but often subordinated and beneficial.

Such symbolic characters built a continuous background to observe consistently in different cultures, regions and times. Against this background a conspicuous change in the reputation of carnivores took place in the course of the last 10 000 years of human history. These changes always mirror contemporaneous shifts in human's way of life and in religious and spiritual beliefs. They can be detected in prehistoric and historic times as well as in recent days.

People associated and personalised elementary forces of nature, such as death and power over the lives of others particularly with the large wild carnivores bear and wolf in prehistory and early historic times. Later, in the Christian Middle Age, the belief of the presence of devil, who can appear as an animal, and of witches, accompanied by diabolic creatures, strongly influenced the reputation of carnivores, both wild and domesticated. Accordingly, the human relationship to animals, in particular to carnivores, was always part of the regnant world view or world concept in the past. This still holds true today, were the reputation of carnivores has changed again in large parts of Europe. Due to environmental problems, the extinction of

species and decreasing populations of many animals and plants, ideas to protect environment and species are relevant to society. In this modern perspective bears and wolves are decisive indicator species for intact ecosystems. Along with the spread of the idea to protect nature, this aspect becomes manifest in strong international statutes for conservation of species. Thereby, at least in many part of Europe in the changeful history of human-carnivores-interactions a new chapter is opened.

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SUMMARY / ZUSAMMENFASSUNG

Humans and their Relationship to Large Carnivores in Central Europe from Foragers to Modern Times:

A Survey

Carnivores were always exploited for their pelts and their meat, even if the latter function might have been in many cases a secondary product only. In particular the human relation to wolves and dogs far exceeds the level of pure hunting objects and dietary source. Since Mesolithic times dogs were emotional objects for their owners with an semi-human status. Through all times and on most continents dogs were regular buried, partly just to honour them, partly because the dog had to be its owner's companion and helper also in the afterlife.

Cats, although domesticated since four millennia and living closely to humans in Central Europe since 1000-2000 years, have not developed such a strong connection to humans and vice versa. In contrast to dogs, graves of or with cats are scarce, and up to modern times the human relation to cats was characterised by reservation. This is caused by the biology of the cat's behaviour and led for millennia to a more utilitarian function of this mouse-hunting species.

The wildcat, but also the larger species wolf and bear were no economically relevant objects of human hunting for many thousands of years after the end of the Ice Age. Only in the 1st millennium AD bear hunting became more common, but potentially often limited to special purposes. In several regions a connection either to burial customs or to hunting, performed by the social elite, can be recorded.

Remains and even indirect references of wolves in human context are particularly rare from Central European Stone to Iron Age. Without question the fur of wolves was used, but it was of minor relevance in comparison to the pelt of other species such as beaver or fox.

In the course of Christianisation, both bears and wolves were demonized and hunted to extinction in large parts of Europe. Recently, a comeback is to observe, accompanied by social discussions. However, the increasing population of wolf, bear, and lynx – partly due to wildlife conservation or restoration programs – could be a reflection of a slowly changing attitude towards these species in the Central European human society.

Der Mensch und seine Beziehung zu Großraubtieren in Mitteleuropa von der Steinzeit bis zur Neuzeit: ein Überblick

Karnivoren wurden schon immer wegen ihrer Felle und ihres Fleisches gejagt, auch wenn letzteres in vielen Fällen nur ein Nebenprodukt gewesen sein mag. Insbesondere die Beziehung des Menschen zu Wölfen und Hunden geht weit über die Ebene des reinen Jagdobjekts hinaus. Seit dem Mesolithikum waren Hunde für ihre Besitzer emotionale Objekte mit einem halb-menschlichen Status. Zu allen Zeiten und auf den meisten Kontinenten wurden Hunde regelmäßig begraben, teils um sie zu ehren, teils weil der Hund seinem Besitzer auch im Jenseits als Begleiter und Helfer dienen sollte.

Katzen, obwohl seit vier Jahrtausenden domestiziert und in Mitteleuropa seit 1000-2000 Jahren eng mit dem Menschen zusammenlebend, haben keine so starke Bindung zum Menschen entwickelt und umgekehrt. Im Gegensatz zu Hunden sind Gräber von oder mit Katzen in der Archäologie rar, und bis in die Neuzeit war das Verhältnis des Menschen zu Katzen von Vorbehalten geprägt. Dies ist in der Biologie des Katzenverhaltens begründet und führte über Jahrtausende zu einer eher utilitaristischen Funktion dieser mäusejagenden Spezies.

Die Wildkatze, aber auch die größeren Arten Wolf und Bär waren viele Jahrtausende nach dem Ende der Eiszeit keine wirtschaftlich relevanten Jagdobjekte. Erst im 1. Jahrtausend n. Chr. wurde die Bärenjagd häufiger, aber oft auf spezielle Zwecke beschränkt. So lässt sich in mehreren Regionen ein Zusammenhang entweder mit Bestattungssitten oder mit der von der gesellschaftlichen Elite ausgeübten Jagd feststellen.

Überreste und sogar indirekte Hinweise auf Wölfe im menschlichen Kontext sind von der mitteleuropäischen Stein- bis zur Eisenzeit besonders selten. Zweifellos wurde das Fell von Wölfen verwendet, doch war es im Vergleich zum Fell anderer Arten wie Biber oder Fuchs von geringerer Bedeutung.

Im Zuge der Christianisierung wurden sowohl Bären als auch Wölfe dämonisiert und in weiten Teilen Europas bis zur Ausrottung gejagt. In jüngster Zeit ist ein Comeback zu beobachten, begleitet von gesellschaftlichen Diskussionen. Die zunehmende von Wolf, Bär und Luchs – zum Teil aufgrund von Artenschutz- oder Wiederansiedlungsprogrammen – könnte jedoch auch Ausdruck einer sich langsam ändernden Einstellung der mitteleuropäischen Gesellschaft gegenüber diesen Tierarten sein.