Our fellow mammalians

Why do mammals fascinate us humans so much? Why do we seem to be more interested in these furry, hairy, mother milk-producing animals than in other organisms? First of all, I guess, because we ourselves belong to the class Mammalia. We feel connected and related.

The relation of humans to their mammalian relatives, though, is more than love and affection. From early mankind on, we have hunted other mammals. First of all, because they provided high-quality food, rich in proteins, minerals and vitamins. In addition, these animals provided our ancestors with skins and bones for clothing and tools. These hunters' relation to their prey was, however, complex and based on respect and admiration. Hunted animals figured, or were worshipped, in sagas and myths, and were depicted on rocks, the oldest forms of human art.

Some mammals posed a threat to humans, who were probably considered as competitors by sabre-toothed cats, hyenas and cave lions. Other mammals were considered as pests, preying on food stocks, and were scared off, kept away or killed. In other words, in those days, humans were self-evidently part of the food chain, as predators, as competitors, possibly even as prey, although, so far, there is no proof of the latter.

Later, when early humans started to settle and grow crops, our ancestors also discovered the benefits of keeping mammals, for economic reasons, i.e. as food resources or as working animals. In the course of millennia, these, mainly hoofed, mammals were progressively domesticated. Over time, selective breeding altered these domesticated mammals into the present-day cows, sheep, goats and pigs that can be found all around us, and which are mostly very distinct from their wild ancestors.

Mammals were also kept for other purposes. Wolves became hunting dogs or served as guards to protect sheep and cattle, or humans. Cats were encouraged to guard the grain harvest from rice and rats. Dogs, cats and mammals such as rabbits and guinea pigs, became increasingly popular for their companionship. Nowadays, many homes have pet mammals, which are often treated by their owners as true friends or family members.

In terms of species diversity, domesticated mammals may not contribute much to the approximately 6400 presently known species of wild mammals (Connor et al. 2018). But when considering biomass, the figures tell a different story. Livestock, which mostly consists of cattle and pigs, completely dominates the mammalian world on earth today, with an estimated 60% of mammalian biomass! Less surprisingly, humans, with an estimated 36%, contribute more than one third (Bar-On et al. 2018).

For wild mammals, this leaves an astonish-

ing low estimate of just about 4% of the total mammalian biomass on earth, including humans, and not even 2% if we only count terrestrial mammals (Bar-On et al. 2018). And if humans are excluded from these calculations, domesticated mammals still outnumber their wild relatives by 14 times.

These figures justify a large exclamation mark, and it is no wonder that there are increasing concerns about what will happen to the world's biodiversity if 'business as usual' remains the norm. Just think about the space and potential mammal habitat these cows and pigs, not to mention the habitat needed to produce all the feed and fodder, take up, in a world that is already crowded by us, humans.

The aforementioned estimated 4% of wild mammal biomass still doesn't say much about the absolute numbers of individuals or species of mammals and how this figure compares to former times. In other words, what has happened to the earth's wild mammals ever since we, humans, entered the scene? Well, humans have probably played a key role in diminishing the number of species (Sandom et al. 2014). During what is called the Quaternary Megafauna Extinction, starting from 50,000 years ago, a relatively small population of no more than five million humans are largely held responsible for the loss of 178 species of the largest mammal species (weighing over 40 kg), mainly by hunting (Barnosky 2008). And if we look further back, at least 351 mammal species are thought to have become extinct since the beginning of the Late Pleistocene, some 126,000 years ago (Andermann et al. 2020). The most significant change came when humans made the transition from hunter-gatherers to farmers and keepers of livestock; even though hunting became less important by then, there was a rapidly growing demand for agricultural space. Over millennia, this caused an increased pressure on wild mammal habitat worldwide, which reduced the population trends and ranges of many species (now listed in IUCN and national Red Lists), including the smaller ones, and the loss of a number of these. In a study of the human impact on the diversity of mammals, Andermann et al. (2020) found that the current extinction rates of mammals are about 1700 times higher than those at the beginning of the Late Pleistocene. They calculated that at these rates, it would take only 810 years to extinguish the 351 mammal species that became extinct over the last 126,000 years.

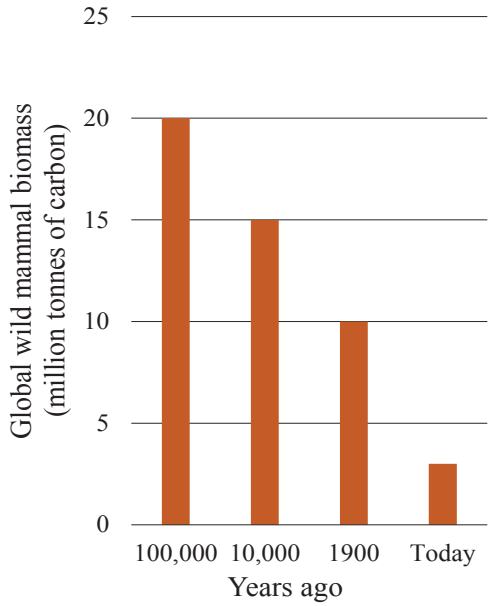

Figure 1. Global estimates of the wild terrestrial mammalian biomass over time since the rise of humanity. After Barnosky (2008), Smill (2011), Bar-On et al. (2018) and Ritchie (2021).

Now if we look at the estimated amount of terrestrial mammalian biomass worldwide over the last 100,000 years (as reconstructed by Ritchie (2021), using various sources (Barnosky 2008, Smil 2011, Bar-On et al. 2018)), the picture is similarly dramatic (figure 1). Since the rise of humans, there has been an estimated decline of 85% of wild mammals. From what we know now, human activity was an important driver of the extinctions that took place thousands of years ago, and has been by far

the most significant cause in our more recent past, when the rate of mammal extinctions has become much faster than before.

Given these reflections of the past, the future of our fellow, wild, mammalians seems gloomy, at least. This is also foreseen by Andermann et al. (2020) who predict a future extinction rate that, by 2100, will be much greater than what we see now. It's not all doom-mongering, however. The same authors, and others, also see options to turn the tide, to a certain degree, by increasing our conservation efforts (see also Leclère et al. 2020). So let's be optimistic, and keep our faith in maintaining what is left of the diversity of wild mammals, and the natural world in general, that still exists around us.

Speaking about diversity, this issue highlights a fair number of mammal species, including four voles. In cattle-grazed parts of the Netherlands, outbreaks of common voles (*Microtus arvalis*) used to be common but then for several decades, were almost unwitnessed. They recently seem to have returned. In an overview, Wymenga et al. analyze the circumstances in which these recent outbreaks have occurred and provide possible explanations for them. In contrast to the common vole, the root vole (*Alexandromys oeconomus*) is a species in decline in the Netherlands. To get a clue about why, and what can be done in favour of the root vole, Paardenkooper & van Schie studied the habitat preferences in a wetland area of the endemic subspecies *arenicola*. Van Manen & Smaal unravel the activity of another vole, the bank vole (*Myodes glareolus*). Using camera traps they found out more about the voles' circadian and ultradian rhythms. The last vole in this issue, field vole (*Microtus agrestis*), was subject of an entirely different study. From owl pellets, Bekker extracted a field vole skull with an atypical dental pattern. In a short note, the author presents his ideas about the cause of this abnormality.

Two of this issue's papers highlight much larger mammals. Van Mourik & de Jong studied phenotypic differences in antler development in red deer (*Cervus elaphus elaphus*) in two different, human-dominated, areas of the Veluwe. Heerebout presents a stranding of a sperm whale (*Physeter macrocephalus*) on a small island in Zeeland in the year 1429. This rarely reported event was 'unmasked' by a drawing in a local account.

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