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Hanna Mamzer
https://orcid.org/0000-0002-2251-7639
Adam Mickiewicz University in Poznań, Faculty of Sociology
Institute of Oceanology of the Polish Academy of Sciences

Jan Marcin Węsławski
https://orcid.org/0000-0001-8434-5927
Institute of Oceanology of the Polish Academy of Sciences

Identification—Categorizing Living Creatures and Human Cultural Practices*

Идентификация –
классификация живых существ
и культурные практики человека

Абстракт

Авторы широко комментированного отчета IPBES от 2019 года предупреждают, что около миллиона видов, живущих в настоящее время на земле, скоро вымрут. Однако в дискуссиях, ведущихся как в СМИ, так и среди профессионалов поднимается другая проблема – мы не знаем, сколько видов обитает на земле. Согласно обширным исследованиям и статистическому моделированию существует не менее шести миллионов видов, которые еще не описаны или не названы. Термин «описанный вид» означает, что животное или растение получили уникальное научное название, подтверждающее его идентичность и родство с другими живущими существами.

Identification–Categorizing
Living Creatures
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Abstract

A widely publicized IPBES report from 2019 warns that close to one million species currently on Earth will soon be extinct. In addition to debates in the media and among professionals about the factual value of that number, a larger problem remains—we do not know how many species are on Earth. According to extensive studies and statistical modelling, there are at least six million species in existence that have not yet been described. The term "described species" means that the animal or plant has received a unique scientific name that confirms its identity and relation to other organisms. A question thus remains about how we value species that are not yet named, known, or discovered. The most common practice is to value

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Таким образом, остается вопрос о том, как мы оцениваем виды, которые еще не названы, не известны или не обнаружены. Наиболее распространенной практикой является оценка только тех существ, которые непосредственно связаны с человеческим существованием, однако встречаются размышления о том, что мы должны ценить животных также ради их существования, за их внутреннюю ценность. В связи с этим необходимо пересмотреть такие антропоцентрические понятия как «вредитель» и «инвазивный вид».

Ключевые слова: биоразнообразие, виды, охрана природы, наименование, идентификация

only creatures that are directly related to human existence, yet there is growing concern that we should value animals for the sake of their existence, for their intrinsic value. In this respect, the anthropocentric concepts of "pest" and "invasive species" need to be re-considered.

Keywords: biodiversity, species, protection, naming, identification

Biodiversity and Extinction

Alarming news about biodiversity loss is a regular part of the narrative about the state of our planet. Serious and complex information was provided by Rockstrom et al.[1] in an issue describing areas where the capacity of Earth's resilience was surpassed (e.g., CO_2 concentration, eutrophication, and biodiversity loss). Administrative efforts to stop biodiversity loss have been undertaken by many local and country actors worldwide, including multinational initiatives such as the Gothenburg Declaration that EU countries signed in 2000 in an effort to stop biodiversity loss in the EU by 2010.

However, there are major problems underlying all these efforts. The first one relates to the actual definition of biodiversity, as the original text from the Earth Summit in Rio 1992 is very broad and inclusive (from genes and species to ecosystems and landscapes). Practically speaking, species identification remains the main measure of biodiversity—which is why so many statistical methods for conducting object counts have been introduced. The basic measure of biodiversity is the number of species present in a given area. Even this measure creates uncertainties. What does "present" mean—observed once? Breeding? Migrant? What does "absent" mean—not recorded in last year? Not seen in areas where it was observed before? The second problem is the one of identification—the identity of a species. The third problem relates to defining species as pests or invasive species.

[1] Johan Rockström et al., "A Safe Operating Space for Humanity," *Nature*, vol. 461, no. 7263 (2009): 472–475.

The eradication of a species (extinction) is a grave crime against the natural world, because each species (group of animals that cannot successfully interbreed with another group) is a unique product of evolution that cannot be repeated; indeed, the probability that natural selection will produce the same species twice is incomprehensibly low. To prove that a species is extinct is not a trivial task, as one needs to give evidence that something does not exist rather than just being rare, overlooked, or hidden. A classic example of species extinction is the dodo (*Raphus cucullatus*)—a large flightless pigeon from small islands in the Indian Ocean that was discovered in the 12th century and was exterminated by starving sailors in less than a century. There is no doubt that dodo is extinct, as it had been described and observed on only a few small isolated islands. Before dodo was hunted to extinction, it was properly described, painted, mounted, and displayed as a specimen in a number of curiosity collections. The bones and bills were used as decorative items. Finally, the dodo entered fine arts and literature in proverbs (*Gone like the dodo*) as well as in other sources of inspiration.

Uncertainty in discussions about species loss on Earth stems from the variety of meanings of the word "extinct." The term may mean that species is extinct regionally or locally. It may be extinct functionally (e.g., single seagrass shots do not perform the same function as a dense meadow), or the species might be extinct commercially (e.g., a tuna species that has been so badly overfished that commercial catch is no longer profitable) but still the species might still exist biologically. A common error is mixing a species population size (number of individuals) with the existence of species. The reduction of 90% of common guillemots in the Barents Sea in 1987–1988 was a dramatic drop in population size, yet this did not equate to "extinction" (the population has recovered in subsequent years).

Naming a Species

Linguists and culture sociologists have generated numerous theories and papers about "proper names" or names that are given as a unique identifier of a person, creature or landscape. In some cultures, the "true name" of an individual person or animal is a secret, as it may give one the power to control the properly named creature. This concept continues to exist in modern culture, for example, in Ursula K. le Guin's *Earthsea* books.[2]

[2] Ursula K. Le Guin, *Earthsea Quartet* (London: Penguin Books, 2012).

Since the time of Linnaeus (18th cent.), Western European culture has used binominal nomenclature, which is regarded as a universal system for naming plant and animal species. Problems with this system have arisen over the years, especially when the field of microbiology revealed the multitude of unicellular microorganisms that exist and that hardly fulfil the criteria for being a "species." The solution was to adopt operational taxonomy units (OTUs) as descriptive categories based on the molecular characteristics of an organism. There have been attempts to introduce numerical codes or barcodes (recently molecular) as a general system that could unite higher organisms and the microbial world. Nevertheless, a great majority of scientists still use binominal Latin names instead of codes—and even in the media, names like *Escherichia coli* (a common bacteria whose presence indicates water of poor quality) persist. To date, only viruses (clones, strains) have been named using numbers; hence, the famous bird flu virus was coded TN51. In general, then, naming species creates continuous debates.[3]

On the other hand, numbering species instead of giving them names resembles procedures applied to livestock: the countless animals that are slaughtered each day have no names, just numbers. By using numbers instead of names, humans can easily apply effective assembly line concepts to the animal products industry. This concept is widely discussed in animal studies where the idea of numbering animals has been likened to the methods used in concentration camps to code information about imprisoned persons in the numbers tattooed on their arms.[4] The idea of numbering organisms instead of naming them evokes culturally rooted controversies about the equalizing of all species (plants, animals, humans, etc.).

The naming of multicellular organisms (Metazoa) is a traditional job of biologists and was widely regarded in the 19th century as the science of systematic biology or taxonomy. This field of biology was ridiculed after the introduction of molecular methods for organism identification, and soon, worldwide concern about "taxonomic impediment" arose in scientific circles. Surprisingly, taxonomy is not a forgotten science and still exists today, as more new species are discovered and named each year than ever before in history. Large multinational projects are focused on biodiversity and still support systematic biology and the art of species naming.

This 19th-century process of naming and "discovering" species calls for some discussion as well. Invasive methods for obtaining material for further research in the name of identification are often occluded or romanticized in popular memory. A meaningful example of such a phenomenon is provided in pop culture productions that promote scientific work and interests. In Bernd Heinrich's book *The Snoring*

[3] Anthea Gentry, Juliet Clutton-Brock, and Colin Groves, "The Naming of Wild Animal Species and Their Domestic Derivates," *Journal of Archaeological Science*, vol. 31 (2004): 645–651, accessed January 30, 2019, https://doi.org/10.1016/j.jas.2003.10.006.

[4] Charles Patterson, *Wieczna Treblinka*, trans. Roman Rupowski (Opole: Vega!POL, 2003).

Bird: My Family's Journey Through a Century of Biology,[5] in very engaging narration, the author describes his desire to locate a bird species that is believed to be extinct. The reader does not have any real sense of what is going to happen. Reading this emotional narrative about author's life and his relationship with his father, who also obtained animals for scientific institutions and museums, the reader loosens his or her vigilance and begins to identify with the main character in the book, forming an emotional bond with him. The character travels the world to find the bird and finally does so—the bird is found. Then, it is killed and stuffed for further "scientific purposes."[6]

A similar narration is presented in the 2004 Canadian movie *The Blue Butterfly* directed by Léa Pool. A terminally ill boy dreams about catching a *Morpho* butterfly. He manages to convince worldwide known entomologists to undertake a scientific expedition to search for the *Morpho*. After many difficulties and challenges, the boy manages to catch the butterfly. When he is just about to inject a chemical substance for killing and preserving the butterfly, he realizes he should not do it, so he gives up and sets the insect free. What we witness here is a romanticized narrative about preserving the life of an animal. The very real death that occurs is hidden behind a sophisticated goal: to find the insect, catch it, and keep it as part of a collection. Very similar language is used by Bernd Heinrich. In his books, he obscures the killing of animals by presenting charming narratives about the work: his personal biography, the emotions that scientists feel during their work and the ultimate scientific goal of the mission. It is also worth emphasizing that the crucial reason why the sick boy was able to convince the famous entomologists to take him with them on the expedition was that they saw the insect collection displayed on the walls in the boy's room. This proof of scientific passion became a real argument for taking him. In the case of the search for the butterfly above, this species already had a name, but the whole process of catching the butterfly strongly resembled the process of identifying a new species, which also involves "collecting" animals. They are killed and named so that we humans can then protect them.

Higher Taxa Only?

The overall biodiversity of Earth is not known. We usually talk about Metazoa species only, and the officially registered number of Eukaryota (broader

[5] Bernd Heinrich, *The Snoring Bird: My Family's Journey Through a Century of Biology* (New York: Harper Perennial, 2008).

[6] Comp. Hanna Mamzer, "Zasłanianie zwierzęcej śmierci. Na marginesach książek Bernda Heinricha," *Zoophilologica. Polish Journal of Animal Studies*, vol. 5 (2019): 382–388.

category that includes microorganisms and Metazoa) is close to two million now.[7] More than half of this number are land insects—the group of organisms that is easy to find and have thus been studied in great detail. Assessing the number of existing (known and unknown) species on Earth has been the goal of numerous projects and papers, and recent estimations put the number at approximately six million species, the majority of which are in the poorly known and live in the deep sea.[8] Nevertheless, biodiversity relies on millions of unicellular species and tiny, hidden creatures that hardly fit popular views of what constitutes an "animal." On the other hand, knowledge about higher taxa—vertebrates such as mammals and birds—is more complete, with an estimated 90% of species described and named.[9]

For humans, such a diversity of species presents a cognitive challenge in understanding the differences and specificity of particular species. This problem was described by Peter Singer in his already classic book, *Animal Liberation: A New Ethics for Our Treatment of Animals*,[10] where he emphasized that humans tend to use the notion of "animals" to cover the whole range of species from prokaryotic, unicellular life forms to primates sharing 98% of their genome with humans. However, in general public perception, "animals" are usually mammals, and the perception of various animal species is deeply rooted in the imagined emotional and cognitive sensual capabilities ascribed to a given type of animal based on anthropomorphization.[11]Here, we need to recall the concept of discrimination based on species membership, described as "speciesism," and widely discussed by Richard Ryder.[12]

[7] Mark J. Costello, Simon Wilson, and Brett Houlding, "Predicting Total Global Species Richness Using Rates of Species Description and Estimates of Taxonomic Effort," *Systematic Biology*, vol. 61 (2012): 871–883.

[8] Camilo Mora et al., "How Many Species Are There on Earth and in the Ocean," *Plos Biology*, vol. 9 (8) (2011), https://doi.org/10.1371/journal.pbio.1001127.

[9] Costello et al., "Predicting Total Global Species Richness," 871–883.

[10] Peter Singer, *Animal Liberation: A New Ethics for Our Treatment of Animals* (New York: The New York Review, 1975).

[11] James A. Serpell, "Factors Influencing Human Attitudes to Animals and Their Welfare," *Animal Welfare*, vol. 13 (2004): 145–151; Anna Gunnthorsdottir, "Physical Attractiveness of an Animal Species as a Decision Factor for Its Preservation," *Anthrozoös*, vol. 14, no. 4 (2001): 204–215.

[12] Richard D. Ryder, *Animal Revolution: Changing Attitudes Towards Speciesism* (Oxford: Berg Publishers, 2000); Richard D. Ryder, *Speciesism, Painism and Happiness: A Morality for the Twenty-First Century* (Exeter: Imprint Academic, 2011).

Valuing Useful Organisms

Once a new species is discovered, it may become very popular among humans, as was the case of the Yeti crab (*Kiwa hirsuta*) discovered in 2005 in the deep Pacific Ocean. This animal appeared on the front pages of popular magazines and played a role in art exhibitions, cartoons and movies. Less popular were the also recently discovered giant tube worms living in cracks in the deep sea—the Vestimentifera. These deep-sea creatures are removed from the experience of common citizens. One needs space technology to go to the abyss and catch or photograph them. The practical-use value of such organisms is non-existent, yet their cultural and intellectual value is great—as their existence opens our eyes to new alternative ecosystems—if not entire worlds (e.g., animals that do not need sunlight and that rely on sulfur metabolism). Deep sea cold coral reefs that were discovered in Norway in the 1990s generated great public concern for the corals (specifically the *Lophelia pertusa*, the main reef-forming species) and nationwide demand to protect the commercially useless yet beautiful wonders grew.

Humans define some species as "useful." This characterization of usefulness represents a type of symbolic violence. By defining a species as useful or useless, humans automatically determine what types of action may be taken towards the species. Only arbitrary, subjective judgement justifies such a process to satisfy the egoistic interests of *Homo sapiens*.[13] Human thinking dictates that useful species need to be taken care of, while useless species should be eliminated (they are often classified as pests or weeds). To preserve useful species, humans are willing to sacrifice the welfare, wellbeing and even life of individual animals, or everything, to protect this "category" of species. This is the basis for criticism towards contemporary zoological gardens. Animals kept in such places are always forced to live in conditions insufficient for their needs, which therefore cannot be satisfied. Animals serve as gene donors for the sake of saving a species. Individual comfort and well-being are sacrificed for the survival of the species, usually when all HIPPO factors are observed (habitat loss, invasive species, pollution, population growth, and *overharvesting*), and the species has no chance of survival in its natural environment.[14]

Therefore, while endangered species need to be protected, those not endangered species can be exploited. Useless or pest species need to be eliminated, useful species should be taken care of, according to the majority of humans. And yet usefulness is justified by at least aesthetic arguments, but often by unique size or colour (measures

[13] Margot DeMello, *Animals and Society. An Introduction to Human-Animal Studies* (New York: Columbia University Press, 2012).

[14] Edward O. Wilson, *Pół Ziemi. Walka naszej planety o życie* (Warszawa: Wydawnictwo Aletheia, 2017).

irrational from ecological perspective). Such artificial divisions dictated by human interests usually have serious real consequences not only for whole categories of living creatures, but, most importantly, for actual individual animals and plants. Human engineering, which involves the extermination of pest species, has had devastating consequences. The best example was the Chinese Four Pests Campaign that took place between 1958 and 1962, when the Chinese government decided to exterminate flies, sparrows, rats, and mosquitoes.[15] The outcome of this project was a massive wave of starvation that caused millions of human deaths. A similar concept pushed Australians to kill invasive rabbits[16] and dingo dogs.[17] There are many similar examples. All of them have generated negative consequences for ecosystems beyond the lives of many animals. Ultimately, life is an autotelic value, be it human or animal life.

Individual Animals—Personalities vs Numbers

Since the beginning of recorded history, there have been animals that were associated with humans and recognized as having personalities and individual names. Horses of famous warlords, service dogs in armies and accompanying polar explorers. This phenomenon has varied in different cultures, a typical example being the "race to the south Pole" between explorers Scott and Amundsen. Scott, with his British affection for dogs and horses, refused to use the animals to their limits, declaring that a gentleman would rather haul the sledge himself than expose such animals to extreme suffering. All his horses and dogs were given names that were recorded in diaries of expedition members. In contrast, Amundsen planned his trip in such a manner that dogs had been killed on the way to provide food for the remaining dogs. Consequently, most of his dogs were nameless, with only pack leaders being individually recognized.

[15] Khalid Manzoor Butt and Sarah Sajid, "Chinese Economy under Mao Zedong and Deng Xiaoping," *Journal of Political Studies*, vol. 25, (1) (2018): 169–178; Xizhe Peng, "Demographic Consequences of the Great Leap Forward in China's Provinces," *Population and Development Review*, vol. 13, no. 4 (1987): 639–670.

[16] Marlene Jahnke et al., "Evolution and Phylogeography of the Nonpathogenic Calicivirus RCV-A1 in Wild Rabbits in Australia," *Journal of Virology*, vol. 84, no. 23 (2010): 12397–12404, https://doi.org/10.1128/JVI.00777-10, accessed April 16, 2021.

[17] Laurie K. Corbett, *The Dingo in Australia and Asia* (Sydney: University of New South Wales Press, 1995); Laurie K. Corbett, "*Canis lupus* ssp. Dingo," in The IUCN Red List of Threatened Species 2015 [online], version 2015.1, accessed January 30, 2019; Philip Holden, *Along the Dingo Fence* (Sydney, Auckland, London, Toronto: Hodder and Stoughton, 1991).

Amundsen's dogs were meant to be purely utilitarian instruments.[18] They had the status of a tool being used to obtain a very specific goal: to achieve the expedition's goal. Leaving such animals nameless was a conscious procedure to create emotional distance between the humans and animals (this is similar to the strategy mentioned above, of identifying animals by number instead of using names). Such a strategy was especially useful when the decision to kill dogs had to be made. It is much easier to exploit animals that are emotionally distanced from humans and with whom humans have no personal-emotional connection. The lack of a name and the ignoring of individual personality traits and unique behaviours made it easier to focus on the task at hand, despite the fact that the task was being done against the animal's will.[19]

Conclusion

Naming is not an innocent process. This process can create domination. Giving a name allows us to distinguish a subject from the mass of nameless individuals. The one who is named becomes visible, stands out and invites taming. Human brain functions are based on the process of categorizing information, which allows selection and organization. As a result, a sense of control and predictability is obtained. From this point, it is easy to start processes of domination and exploitation. In such situations, it is clear that not having a name can still have positive outcomes for the one who would receive the name. At this point, it is also worth asking the question of whether animals give names to humans.

An interesting step towards "nameless nature" was the widely publicized circumglobal cruise of the yacht TARA, on which French researchers collected plankton samples from all of the oceans and produced data on the genome diversity of various regions. Again, the information that in one place, there are 10,000 genomes of something and, in another, only 2,000 does not bring us closer to understanding organisms' identity, much less their role in an ecosystem. It is unlikely that people will start to care about the number of still undiscovered OTUs. Even if we appreciate something as an oxygen or protein provider, it may be difficult to develop empathy and personal attachment to it. One might think that we value "the forest" or "plankton" as an abstract being or we value the trees and other organisms that form the forest because we know them by name. A very drastic example of this social phenomenon

[18] Mary R. Tahan, *Roald Amundsen's Sled Dogs: The Sledge Dogs Who Helped Discover the South Pole* (Cham: Springer Nature, 2019).

[19] Hanna Mamzer, "Zwierzęce imiona – upodmiotowienie czy zawłaszczenie," *Zoophilologica. Polish Journal of Animal Studies*, vol. 3 (2017): 163–179, accessed April 16, 2021.

happened in British Columbia in the 1990s, when Grand Hadwin, a former logger and turned environmentalist, attempted to raise the alarm among Canadians about massive logging of the rainforest in BC, which had led to cutting down a sacred tree, a golden Sitka spruce that even had its own name among First Nations communities (*Kiidk'yaas*). Various locals and First Nations communities had protested for years to deaf ears that to the massive logging industry should be stopped, and they were outraged by the removal of this single tree.

"We protect what we love, we love what we know, we know what we were taught"—this famous statement by Senegal environmentalist and poet Baba Dioum illustrates well the need for names and for the recognition and appreciation of the individuals that come from nature. Another option is nameless nature—a green anonymous mass that is more a landscape than a group of organisms.

Bibliography

Chandrasena, Nimal. "Living with Weeds—A New Paradigm." *Indian Journal of Weed Science*, vol. 46 (2014): 96–110.

Chandrasena, Nimal. "'Alien' Species, 'Pertinacious Weeds' and the 'Ideal Weed'—Revisited." *Weeds*, vol. 2 (2020): 1–15.

Corbett, Laurie K. *The Dingo in Australia and Asia*. Sydney: University of New South Wales Press, 1995.

Corbett, Laurie K. "*Canis lupus* ssp. Dingo." In *The IUCN Red List of Threatened Species* 2015 [online], version 2015.1. Accessed January 30, 2019.

Costello, Mark J., Simon Wilson, and Brett Houlding. "Predicting Total Global Species Richness Using Rates of Species Description and Estimates of Taxonomic Effort." *Systematic Biology*, vol. 61 (2012): 871–883. https://doi.org/10.1093/sysbio/syr080.

Davis, Mark A., and Ken Thompson. "Invasion Terminology: Should Ecologists Define Their Terms Differently Than Others? No, Not If We Want to be of Any Help." *ESA Bulletin*, vol. 82 (2001): 206.

DeMello, Margot. *Animals and Society. An Introduction to Human-Animal Studies*. New York: Columbia University Press, 2012.

Evans, Clinton L. *War On Weeds in the Prairies West: An Environmental History*. Calgary, AB: University of Calgary Press, 2002.

Fitzgerald, Gerard. *Public Attitudes to Current and Proposed Forms of Pest Animal Control*. Canberra: Invasive Animals Cooperative Research Centre. University of Canberra, 2009.

Fraser, Anthony. *Public Attitudes to Pest Control. A Literature Review*. Wellington: Science & Technical Publishing. Department of Conservation, 2006.

Gentry, Anthea, Juliet Clutton-Brock, and Colin Groves. "The Naming of Wild Animal Species and Their Domestic Derivates." *Journal of Archaeological Science*, vol. 31 (2004): 645–651. Accessed January 30, 2019. https://doi.org/10.1016/j.jas.2003.10.006.

Goffman, Erving. *Instytucje totalne*. Gdańsk: Gdańskie Wydawnictwo Psychologiczne, 2011.

Le Guin, Ursula K. *Earthsea Quartet*. London: Penguin Books, 2012.

Gunnthorsdottir, Anna. "Physical Attractiveness of an Animal Species as a Decision Factor for Its Preservation." *Anthrozoös*, vol. 14, no. 4 (2001): 204–215.

Heinrich, Bernd. *The Snoring Bird: My Family's Journey Through a Century of Biology*. New York: Harper Perennial, 2008.

Holden, Philip. *Along the Dingo Fence*. Sydney, Auckland, London, Toronto: Hodder and Stoughton, 1991.

Jahnke, Marlene, Edward C. Holmes, Peter J. Kerr, John D. Wright, and Tanja Strive. "Evolution and Phylogeography of the Nonpathogenic Calicivirus RCV-A1 in Wild Rabbits in Australia." *Journal of Virology*, vol. 84, no. 23 (2010): 12397–12404. Accessed April 16, 2021. https://doi.org/10.1128/JVI.00777-10.

Mamzer, Hanna. "Zasłanianie zwierzęcej śmierci. Na marginesach książek Bernda Heinricha." *Zoophilologica. Polish Journal of Animal Studies*, vol. 5 (2019): 382–388.

Mamzer, Hanna. "Zwierzęce imiona – upodmiotowienie czy zawłaszczenie." *Zoophilologica. Polish Journal of Animal Studies*, vol. 3 (2017): 163–179. Accessed April 16, 2021.

Manzoor Butt, Khalid, and Sarah Sajid. "Chinese Economy under Mao Zedong and Deng Xiaoping." *Journal of Political Studies*, vol. 25, no. 1 (2018): 169–178.

Mora, Camilo, Derek P. Tittensor, Sina Adl, Alastair G. B. Simpson, and Boris Worm. "How Many Species Are There on Earth and in the Ocean." *Plos Biology*, vol. 9 (8) (2011). https://doi.org/10.1371/journal.pbio.1001127.

Patterson, Charles. *Wieczna Treblinka*. Translated by Roman Rupowski. Opole: Vega!POL, 2003.

Pedersen, Helena. "Knowledge Production in the 'Animal Turn': Multiplying the Image of Thought, Empathy, and Justice." In *Exploring the Animal Turn: Human-Animal Relations in Science, Society and Culture*, edited by Erica Andersson Cederholm, Amelie Björck, Kristina Jennbert, and Ann-Sophie Lönngren, 13–19. Lund: Lund University, 2014.

Peng, Xizhe. "Demographic Consequences of the Great Leap Forward in China's Provinces." *Population and Development Review*, vol. 13, no. 4 (1987): 639–670.

Rockström, Johan, Will Steffen, Kevin Noone, and Åsa Persson. "A Safe Operating Space for Humanity." *Nature*, vol. 461, no. 7263 (2009): 472–475.

Ryder, Richard D. *Animal Revolution: Changing Attitudes Towards Speciesism*. Oxford: Berg Publishers, 2000.

Ryder, Richard D. *Speciesism, Painism and Happiness: A Morality for the Twenty-First Century*. Exeter: Imprint Academic, 2011.

Serpell, James A. "Factors Influencing Human Attitudes to Animals and Their Welfare." *Animal Welfare*, vol. 13 (2004): 145–151.

Singer, Peter. *Animal Liberation: A New Ethics for Our Treatment of Animals*. New York: New York Review, 1975.

Tahan, Mary R. *Roald Amundsen's Sled Dogs: The Sledge Dogs Who Helped Discover the South Pole*. Cham: Springer Nature, 2019.

Wilson, Edward O. *Pół Ziemi. Walka naszej planety o życie*. Warszawa: Wydawnictwo Aletheia, 2017.

Hanna Mamzer – profesor Uniwersytetu im. Adama Mickiewicza w Poznaniu. Pracuje na Wydziale Socjologii UAM. Zajmuje się zagadnieniami związanymi z przemianami współczesnej kultury, socjologicznymi aspektami tożsamości oraz problematyką wielokulturowości, a także szeroko rozumianych zmian społeczno-kulturowych zachodzących w kręgu cywilizacji zachodnio-europejskiej, w szczególności nowymi relacjami społecznymi (także międzygatunkowymi). Autorka wielu publikacji poświęconych relacjom ludzi i zwierząt. Dwukrotna stypendystka Fundacji Fulbrighta, Central European University, British Council, Programu Socrates Erasmus, European University Institute, Fundacji im. Stefana Batorego, laureatka akcji stypendialnej Polityki, innych licznych nagród i wyróżnień. Prowadzi szeroko zakrojoną współpracę międzynarodową. Członkini Lokalnej Komisji Etycznej ds. Eksperymentów na Zwierzętach i biegły sądowy z dobrostanu zwierząt przy Sądzie Okręgowym w Poznaniu. E-mail: mamzer@amu.edu.pl

Hanna Mamzer – professor at Adam Mickiewicz University in Poznań, Poland. Her scientific research interests are focused on posthumanism and human-animal studies. Within this framework scientists try to re-define human position in the natural world and question anthropocentric perspective on human–non-human relations. Author of many publications analyzing human–non-human relationships. Hanna acts as expert witness for Polish courts, providing professional opinions and expertise in cases of animal abuse and maltreatment. Member of the Local Ethical Committee on Experiments on Animals (for Polish Ministry of Science and Higher Education). Grantee of Polish and international scholarships. Among many others, she has received two Fulbright Commission's grants (2005 and 2018), Central European University grant in Budapest, and Clare Hall College grant in Cambridge, UK. Email: mamzer@amu.edu.pl

Jan Marcin Węsławski – prof. dr hab., absolwent oceanografii na Uniwersytecie Gdańskim w 1979. Pracował na Stacji Morskiej UG w Helu, Stacji polarnej Instytutu Geofizyki PAN w Hornsundzie, od 1985 – w Instytucie Oceanologii PAN jako szef zespołu Ekologii Morza, a od 2018 – Dyrektor Instytutu. Uczestnik i lider wielu międzynarodowych projektów naukowych oraz grantów NCN. Uczestnik ekspedycji polarnych i morskich do Kanady, Rosji, Grenlandii i na Spitsbergen. Współautor ponad 150 publikacji z listy JCR, cytowany ponad 4 000 razy z indeksem Hirscha 39. E-mail: weslaw@iopan.gda.pl

Jan Marcin Węsławski – professor, D.Litt., PhD., graduate of oceanography at the University of Gdańsk in 1979. Worked at the Hel Marine Station of the University of Gdańsk, and at the polar station of the Institute of Geophysics of the Polish Academy of Sciences in Hornsund, since 1985—at the Institute of Oceanology PAS, first as the Head of Marine Ecology Department and since 2018 as the Head of the Institute. Participated in and led numerous international projects and grants from National Science Council. Took part in marine and polar expeditions to Arctic Canada, Russia, Svalbard and Greenland. Author of over 150 peer-reviewed papers from the JCR list, cited over 4,000 times, with H index 39. Email: weslaw@iopan.gda.pl