

# Moral Circle Explosion

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## Abstract

In this chapter I argue that we should extend moral consideration to a much wider range of beings than we currently do. There are at least two reasons why. The first reason is epistemic: We should be open to the possibility that a very wide range of beings have moral status, and we should extend at least some moral consideration to these beings accordingly. The second reason is practical: We now have the power to impact a very wide range of beings, both within and across species, nations, and generations. The upshot is that we should extend at least some moral consideration to quintillions of beings – including invertebrates, plants, and some artificial intelligences – with revisionary implications for many moral theories.

*Keywords: Moral status, animal ethics, environmental ethics, AI ethics, population ethics.*

## 1. Introduction

Questions about moral status are questions about the scope of our moral community. To whom do we have moral duties, and why? Some answers to this question focus on our capacities. For example, we might think that we have duties to all rational beings, or all sentient beings, or all

living beings.<sup>1</sup> Other answers focus on our relationships. For example, we might think that we have special duties to members of our family, species, nation, or generation.<sup>2</sup> Other answers are possible too. For example, we might think that we should accept all of these theories at once: In this case, we might have one set of duties to rational beings, another to sentient beings, and another to living beings. We might also have one set of duties to individuals with whom we have particular kinds of relationships, and another to everyone else.<sup>3</sup>

At least in Western philosophy, the history of thinking about moral status has been a history of moral circle expansion. As a general trend, we start with a narrow conception of moral status, both because we overestimate what it takes to morally matter and because we underestimate who has what it takes. We then gradually widen our conception of moral status over time, as a result of gradually correcting both of these errors at the same time. For instance, previously many philosophers believed that only rational agents have moral status, but now many philosophers believe that sentience is sufficient. Similarly, previously many philosophers believed that only vertebrates can be sentient, but now many philosophers believe that many invertebrates can be sentient too.<sup>4</sup>

Meanwhile, we are currently expanding our moral circle in another, more practical way as well. In particular, we are currently creating new beings who either do or, at least, might have moral status in the future. For instance, humans are creating new nonhuman animals through selective breeding and genetic engineering, and we are also creating artificial intelligences who might one day be rational, sentient, or alive.<sup>5</sup> We are also impacting increasingly many beings in

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<sup>1</sup> For a classic expression of a rationalist view, see Kant 2012/1785. For a classic expression of a sentientist view, see Bentham 2007/1780. For a classic expression of a biocentric view, see Schweitzer 1929.

<sup>2</sup> For a relational view that emphasizes our duties to fellow humans, see Brody 2012. For relational views that emphasize our duties to other animals, see Gruen 2015 and Palmer 2010.

<sup>3</sup> For discussion of pluralist views, see Nozick 1974 and Anderson 2004.

<sup>4</sup> For discussion of the idea of moral circle expansion, see Singer 1975.

<sup>5</sup> For discussion of chimeras, see Hyun 2016. For discussion of artificial intelligences, see Gunkel 2018.

the world, through activities such as factory farming, deforestation, and the wildlife trade, as well as through effects of these activities such as pandemics and climate change.<sup>6</sup> The upshot is that we will soon be impacting many more possibly sentient beings than we are now, and we will have to develop new moral frameworks to cope with this predicament.

In this chapter I survey these trends and motivate the idea that we should think of our moral circle not as *expanding* so much as *exploding*. I begin in §2 by surveying debates about who has moral status and what moral status is like. Then, in §3, I consider epistemic changes that might contribute to (recognition of) an exploding moral circle. If sentience might not be necessary for moral status, if many beings might be sentient, and if we should err on the side of caution when in doubt, then we should treat many beings as having (at least some) moral status. Finally, in §4, I consider practical changes that might contribute to an exploding moral circle. The more we increase the number and variety of possibly sentient beings in the world and our impacts on those beings, the more we will increase our moral duties accordingly.

## 2. Background

Debates about moral status concern many issues. Some are conceptual. What is moral status, and how is moral status similar to, and different from, other kinds of value or worth? Other issues are moral. Which features are necessary or sufficient for moral status? Does everyone who has moral status have it equally, or do some beings have “higher” moral status than others? Other questions are empirical. Which beings have features that are necessary or sufficient for moral status, according to each view of moral status? For example, do only humans have moral status, or do

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<sup>6</sup> For discussion of the Anthropocene, see Moore 2016 and Sebo 2022.

other animals have moral status too? If the latter, do humans have “higher” moral status than other animals, or do we all have equal moral status? Before we consider the future of this topic, it will help to consider the past and present.

First, what do we mean when we ask whether a particular being has moral status? Typically, we mean to be asking whether this being matters morally for their own sake. For example, consider the difference between you and a painting. I might have a moral duty not to harm or damage either of you unnecessarily. But the difference is that, in your case, I have a moral duty not to harm you unnecessarily both for your sake and for the sake of people who care about you. Whereas in the case of the painting, I have a moral duty not to damage it unnecessarily not for its own sake but rather only for the sake of people who care about it. When we say that humans have moral status but objects do not, this is what we mean: That we can have moral duties to humans, but not objects, for their own sakes.

Moral status, on this interpretation, is different from other kinds of value or worth. For example, moral status is different from aesthetic, cultural, economic, or ecological value. Whether or not a river has moral status, we might still have strong duties to protect it, because of how much value it has for humans and other animals.<sup>7</sup> Moral status is also different from legal or political status. Whether or not a river has moral status, we might still decide to classify it as having particular legal or political rights, provided that this classification allows us to protect it for the sake of humans and other animals more effectively. With that said, these kinds of value can be related too. For example, many people believe, plausibly, that having moral status is sufficient for having particular kinds of basic legal or political status as well.<sup>8</sup>

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<sup>7</sup> For discussion of the many and varied kinds of value a being can have, see Jamieson 2008.

<sup>8</sup> For discussion of moral rights as a basis for legal and political rights, see Donaldson and Kymlicka 2011.

With that in mind, what features are necessary or sufficient for moral status? People have offered many answers to this question. We can very briefly consider eight. First, according to *speciesism*, species membership is the basis of moral status. You have moral status if, only if, and because you are a member of the species *Homo sapiens*. Of course, in a world where many humans are seen as “lesser than,” the idea that *all* humans have moral status might seem progressive. But in a world where many nonhumans are seen as “lesser than” as well, the view that *only* humans have moral status is still deeply regressive. This view is also arbitrary, since species are nothing more than abstract taxonomic categories. There is no reason to think that you can matter morally for your own sake only if you have a particular set of genes.<sup>9</sup>

Second, according to *rationalism*, rationality is the basis of moral status. In order to matter morally for your own sake, you also need to be a moral agent, with moral duties. And in order to be a moral agent, you need to have the capacity for advanced language and reason, since these capacities are what allow you to ask what you morally ought to do. On this view, we might think that only humans have moral status not because only humans have a particular set of genes, but rather because only humans have the capacity for advanced language and reason.<sup>10</sup> But this view is regressive as well. It risks excluding not only many nonhuman animals, but also many humans who lack the capacity for advanced language and reason. But the idea that these individuals lack moral status is inconsistent with modern views about human rights.<sup>11</sup>

Third, according to *sentientism*, sentience – the ability to consciously experience positive or negative states such as pleasure or pain – is the basis of moral status. While you might need the capacity for advanced language and reason to have duties (as well as some rights, such as the

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<sup>9</sup> For critical discussion of speciesism, see Kristin Andrews et al 2018, Chapter 2.

<sup>10</sup> For a modern defense of a kind of rationalism, see Carruthers 1992.

<sup>11</sup> For critical discussion of this kind of rationalism, see Andrews et al 2018, Chapter 3.

right to provide informed consent in some contexts), you do not need this capacity to have any moral rights at all. Instead, all you need to have any moral rights at all is interests, and all you need to have interests is the capacity for positive or negative conscious experience, whether or not you can rationally reflect on your experiences. On standard interpretations (which we will question below), this view implies that many human and nonhuman animals have moral status, but that plants, species, ecosystems, and other such beings do not.<sup>12</sup>

Fourth, according to *biocentrism*, life is the basis of moral status. While you might need the capacity for positive or negative experience to have some moral rights, such as the right not to suffer unnecessarily, you do not need them to have any rights at all. Instead, once again, all you need to have any moral rights at all is interests, and, on this view, all you need to have interests is biological needs, whether or not your biological needs correspond to conscious experiences. After all, we might think, consciousness is only one of many tools that species evolved to meet our biological needs, and why should the tool that we happen to have matter more than the tools that other animals or plants happen to have instead? This view implies that all humans, animals, and even plants matter morally for their own sakes.<sup>13</sup>

Fifth, according to *ecocentrism*, all the above views share a common mistake, which is the assumption that *individuals* are the kinds of beings who have moral status. But in reality, *collectives* are the kinds of beings who have moral status. For example, instead of saying that an individual animal has moral status, we should say that the species or ecosystem of which the animal is part has moral status. Granted, animals can still morally matter. But on this view, they morally matter in the same kind of way that, say, cells morally matter. That is, they matter only insofar as they contribute to the whole of which they are part. Insofar as my cells contribute to

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<sup>12</sup> For a modern defense of sentientism, broadly construed, see Singer 1975 and Regan 1983.

<sup>13</sup> For a modern defense of biocentrism, see Goodpaster 1978.

my flourishing, they matter for my sake. Otherwise they do not. Similarly, insofar as I contribute to the flourishing of my species or ecosystem, I matter for its sake. Otherwise I do not.<sup>14</sup>

Sixth, according to *contextualism*, all of the above views share a different common mistake, which is the assumption that moral status depends on our *intrinsic* features. Instead, they think, moral status depends on our *extrinsic* or *relational* features. After all, morality is inherently relational. If you have moral duties, there has to be someone to whom you have those duties. If you have moral rights, there has to be someone against whom you have those rights. And in many cases, our relationships can partly determine what those duties and rights are. For instance, you have special duties to your children not because your children have special capacities, but rather because you have a special relationship with them. On this view, beings have moral status, if at all, in relation to particular agents in particular contexts.<sup>15</sup>

Seventh, according to *pluralism*, there are multiple kinds of moral status, and there is a different basis for each one. For example, we might think that living beings have moral rights associated with biological flourishing, that sentient beings have moral rights associated with conscious experience, that rational beings have moral rights associated with rational agency, and so on. Moreover, we might think that some moral rights can be held individually and that others can be held collectively, and that some moral rights can be held relative to all agents in all contexts and that others can be held only relative to particular agents in particular contexts. If so, then we might express this view by saying that no particular theory of moral status captures the full truth. Instead, multiple theories each captures part of the truth.<sup>16</sup>

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<sup>14</sup> For a modern discussion of ecocentrism, see Leopold 1949.

<sup>15</sup> For examples of contextual and relational theories, see Gruen 2015 and Palmer 2010.

<sup>16</sup> For discussion of hybrid or pluralist theories, see Anderson 2004 and Nozick 1974.

Eighth, and finally for now, according to *eliminativism*, there is no such thing as moral status at all. We say that having moral status means mattering morally for your own sake. But this idea is shorthand for more specific claims about how we should treat particular beings in particular cases. So, in order to clarify the idea of moral status, we need to ask more: What kinds of values, duties, rights, and so on are we talking about? And once we clarify that, what use do we have for talk of moral status anymore? On this view, then, talk of moral status is neither necessary for moral discourse and practice (since we can talk in more specific terms instead) nor sufficient (since we need to talk in more specific terms to clarify what we mean). So we can eliminate talk of moral status entirely, without sacrificing anything important.<sup>17</sup>

Philosophers ask many other, related questions about moral status as well. For example, does moral status come in degrees, or is it all or nothing? Some people accept that moral status is all or nothing. For example, Peter Singer defends a view that he calls equal consideration of interests. All interests merit equal consideration, no matter whose interests they are. On this view, if I have to decide between saving an elephant and a mouse, I might have reason to save the elephant on the grounds that the elephant has more interests than the mouse does. But I do not also have reason to save the elephant on the grounds that the interests of the elephant matter more than the interests of the mouse. The interests all matter equally, and what breaks the tie is simply the fact that there are more interests in the elephant than in the mouse.<sup>18</sup>

In contrast, other people accept that moral status comes in degrees. For example, Shelly Kagan defends a view that he calls hierarchy. Some interests merit more consideration than others, depending on whose interests they are and how much sentience or agency this being has. On this view, if I have to decide between saving an elephant and a mouse, I not only have reason

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<sup>17</sup> For discussion of eliminativism, see Sachs 2011.

<sup>18</sup> Singer 1975, Chapter 1.

to save the elephant on the grounds that the elephant has more interests than the mouse. I also have reason to save the elephant on the grounds that the interests of the elephant matter more than the interests of the mouse. On this view, then, we should engage in a kind of moral double counting. What breaks the tie between the elephant and the mouse is both how many interests they have in each and how much these interests morally matter.<sup>19</sup>

These debates can be difficult to resolve for a couple of reasons. The first is that it can be hard to trust our intuitions about moral status, since our intuitions might be tracking many different factors at once. For example, even if rationality might not be necessary for moral status, it might still be necessary for particular rights and duties. Similarly, even if life might not be sufficient for moral status, it might still be sufficient for other kinds of value, such as particular kinds of instrumental or extrinsic cultural, ecological, or economic value. As a result, we might agree that many properties and relations morally matter, both in theory and in practice. But we might still disagree about which properties or relations have intrinsic or final moral value, and which merely have extrinsic or instrumental moral value.<sup>20</sup>

Second, it can also be hard to trust our intuitions about moral status since our intuitions are shaped by bias and ignorance. Since we are asking questions about moral status from our own perspective, there is a risk that our intuitions will overvalue properties or relations that humans have and undervalue properties or relations that humans lack. The history of moral progress provides evidence for this bias and ignorance, since we are constantly at risk of drawing arbitrary lines based on race, sex, age, ability, species, and so on. This history makes it hard to trust our own moral intuitions. For example, if we have the intuition that sentience is necessary

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<sup>19</sup> Kagan 2019.

<sup>20</sup> For discussion of the ideas of intrinsic, extrinsic, final, and instrumental value, see Korsgaard 1983.

for moral status, is this intuition tracking the moral truth, or is it simply (once again) drawing arbitrary lines based on a property that humans happen to possess?<sup>21</sup>

Fortunately, as debates about moral status have developed, our views about our moral community have tended to expand. This is partly for ethical reasons and partly for empirical reasons. With respect to ethical issues, Western philosophers are generally more inclusive now than they were in the past.<sup>22</sup> For much of the history of Western philosophy, many philosophers accepted speciesist or rationalist views of moral status. But today, a higher proportion of philosophers accept that speciesism is arbitrary and rationalism is too restrictive to be plausible (at least as the basis for *any kind of moral status at all*). As a result, philosophers increasingly accept that sentience is, if not necessary, then at least sufficient for moral status, and, as a result, that many humans and nonhumans alike matter morally for our own sakes.

Additionally, empirically, we now believe that many more beings are or, at least, might be sentient than we did in the past. For much of the history of Western philosophy and science, many people believed that only humans are sentient because they believed that only humans have souls, and that a soul is necessary for consciousness. Many other people believed that only humans are sentient because they believed that only humans have advanced language and reason, and that advanced language and reason are necessary for consciousness. But scientists and philosophers increasingly accept that neither a soul nor advanced language and reason are necessary for consciousness. As a result, they now accept that many animals, including vertebrates and invertebrates, either are or might be sentient.<sup>23</sup>

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<sup>21</sup> For discussion of how human biases can shape our moral intuitions, see Jamieson 2014, Chapter 5.

<sup>22</sup> My focus in this chapter is on trends in Western philosophy, but I should note that trends in Eastern philosophy might be different and, to the degree that they are, a different response might be warranted.

<sup>23</sup> For an illustration of this emerging consensus, see Low et al. 2012.

I will not try to settle exactly which view of moral status to accept here, nor will I try to settle exactly which beings have moral status on any particular view. Instead, I will assume for the sake of discussion that sentience is at least sufficient for moral status, in the sense that if you have the capacity for positive and negative conscious experience, then I have a moral duty to consider your interests for your own sake when making decisions that affect you. And I will suggest that, on this view, we will need to expand the scope of our moral community substantially in the Anthropocene. Some of the details in what follows will be specific to sentientism. But the general idea that we should expand the scope of our moral community substantially will likely be true for many views of moral status.

### 3. Epistemic changes

First, we should expand the scope of our moral community substantially for epistemic reasons. As I noted a moment ago, the history of moral progress is a history of moral circle expansion. In any particular generation, we tend to overestimate what it takes to morally matter, and we also tend to underestimate who has what it takes. We should be open to the idea that we are still making these mistakes. So, even if we feel confident that, say, sentience is necessary for moral status, we should be open to the possibility that this view is mistaken. And even if we feel confident that, say, only animals can be sentient, we should be open to the possibility that this view is mistaken as well. In this section, I will examine why and how we might need to expand our moral community in light of these possibilities.<sup>24</sup>

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<sup>24</sup> For discussion of moral circle expansion, see Singer 2011.

Our current situation involves two kinds of uncertainty: normative uncertainty and empirical uncertainty. Normatively, we should be at least somewhat uncertain about what it takes to have moral status. For example, many philosophers now believe that sentience is both necessary and sufficient for moral status, on the grounds that whether things can be good or bad for you depends on whether you have a subjective perspective according to which things can be good or bad. But we should accept that this view might be wrong. Thus far, every generation has made serious moral mistakes, and the mistake of being too exclusionary has been much more common than the mistake of being too inclusionary. We have very little reason to think that our generation is the first to finally include everyone who merits inclusion.

Importantly, this possibility matters not only for the future but also for the present. In particular, we might think that in cases of moral uncertainty, we should assign at least some weight to each view that we think might be correct. For example, suppose that I feel 90% confident that moral theory A is correct and 10% confident that moral theory B is correct. Now suppose that moral theory A implies that killing someone is permissible and that moral theory B implies that killing them is impermissible. Intuitively, it seems wrong to simply proceed on the assumption that killing this individual is permissible. If I think that moral theory B has a chance of being correct, and, so, that killing this individual has a chance of being impermissible, then I should factor that possibility into my decision somehow.

On this view, even if I think that only sentient beings have moral status (as I do), I should still extend at least some moral consideration to, say, non-sentient living beings if I think that there is a chance that they have moral status as well (as I do). Granted, it is not easy to say what that means in practice. For example, should I attempt to integrate these views together and then ask what this integrated view requires? Should I keep these views separate and ask what might

represent a reasonable compromise between them? There are other options too, and we are only starting to identify and evaluate them.<sup>25</sup> But for our purposes, it will be enough to accept that if, say, all living beings might have moral status, then we should at least consider our impacts on them and aspire to harm them less, all else equal.

The second kind of uncertainty that our current situation involves is empirical uncertainty. In addition to being at least somewhat uncertain about what it takes to have moral status, we are also at least somewhat uncertain about who has what it takes for each theory. For example, many scientists now find it plausible that many animals are sentient and that plants, species, and ecosystems are non-sentient. But as with our normative views, we should accept that this view might be wrong. Fifty years ago, many experts believed that only humans are sentient. Then we realized that other primates likely are too. Then other mammals. Then other vertebrates. Now some invertebrates too (as we will see in a moment). As we learn more about the nature of consciousness, pleasure, and pain, we might find that this line continues to move.<sup>26</sup>

As before, this possibility matters not only for the future but also for the present. In particular, we might think that in cases of empirical uncertainty, we should once again assign at least some weight to each view that we think might be correct. For example, suppose that I accept that sentientism is true, and I feel 90% confident that theory of mind A is correct and 10% confident that theory of mind B is correct. Now suppose that theory of mind A implies that plants are non-sentient whereas theory of mind B implies that plants are sentient. As before, it seems wrong to simply proceed on the assumption that plants are non-sentient. If I think that theory of mind B has a chance of being correct and, so, that plants have a chance of being sentient, then I should factor that possibility into my decision somehow.

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<sup>25</sup> For discussion of moral uncertainty, see MacAskill, Bykvist, and Ord 2020.

<sup>26</sup> For discussion of our evolving views on animal consciousness, see Andrews 2015.

The result is the same as before. Even if I think that plants are non-sentient (as I do), I should still extend at least some moral consideration to plants if I think that there is at least a chance that they are sentient (as I do). Granted, it is not easy to say what that means in practice either. For example, should I accept a precautionary principle and treat everyone as fully sentient in cases of uncertainty? Should I accept an expected value principle and multiply the probability that everyone is sentient by the amount of experience that they would have if they were? And so on.<sup>27</sup> But for our purposes, it will be enough to accept that if, say, all living beings might be sentient, then we should at least consider our impacts on them and aspire to harm them less, all else equal, *whether or not* sentience is necessary for moral status.

In short, we have at least some to expect that our moral circle expansion is far from over. Our views are more inclusive than they were in the past, for reasons that are partly normative (our predecessors overestimated what it takes to have moral status) and partly empirical (our predecessors underestimated who has what it takes). And we should accept that our views in the future might be more inclusive than they are now, for similar reasons. Thus, we should consider making our current views at least *somewhat* more inclusive, in the spirit of caution. And while the details are still unclear, a general implication of this view seems to be that we should extend at least *some* moral consideration to everyone who at least *might* have moral status, according to any theory of moral status that at least *might* be correct, all else equal.

It is worth emphasizing how many beings we might have reason to morally consider on such a view. (I will focus here on the question which beings might be sentient, but we should keep in mind our normative uncertainty too.) First, consider vertebrates, that is, animals with a spinal column, including amphibians, birds, fishes, mammals, and reptiles. The idea that all

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<sup>27</sup> For discussion of how to treat beings in cases of uncertainty about sentience, see Sebo 2018.

vertebrates are likely to be sentient is now widely accepted in science and philosophy. But we still treat the vast majority of vertebrates as though they lack moral status, including (but not limited to) 100+ billion factory farmed cows, pigs, chickens, and fishes per year.<sup>28</sup> Thus, once we accept that all vertebrates are sentient and extend moral consideration to them accordingly, that will already constitute a major expansion of our moral community.

Second, consider complex invertebrates, that is, animals without a spinal column, but with complex sensory and cognitive systems. For example, octopuses are discontinuous with humans in many ways, but they are also continuous with us in many ways. On one hand, they lack a spinal column, and they also lack a centralized sensory and cognitive system; for instance, instead of having a single brain, they have one “main” brain and another for each arm. On the other hand, octopuses are highly sensitive and intelligent; for instance, they have the capacity for learning, memory, planning, problem solving, and more.<sup>29</sup> I think that octopuses are likely to be sentient on balance. Yet our treatment of octopuses is following the path of our treatment of many vertebrates, with octopus farming currently on the rise.<sup>30</sup>

Third, consider simpler invertebrates, such as insects. Evidence about insect sentience is limited and mixed. On one hand, insects have much simpler sensory and cognitive systems than octopuses, and many insects perform at least some behaviors that suggest non-sentience; for instance, some mantids continue to mate while being eaten alive.<sup>31</sup> On the other hand, insects still have complex sensory and cognitive systems, with hundreds of thousands of neurons each.<sup>32</sup> And many insects perform behaviors that suggest sentience as well; for instance, flies seem to

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<sup>28</sup> Sanders 2020.

<sup>29</sup> For more on octopus minds, see Godfrey-Smith 2016.

<sup>30</sup> For discussion of octopus farming, see Jacquet, Franks, and Godfrey-Smith 2019.

<sup>31</sup> Eisemann et al 1984.

<sup>32</sup> Raji and Potter 2021.

benefit from human antidepressants.<sup>33</sup> On balance, I feel very unsure about whether insects are sentient. Yet the stakes are very high in this case, since, for example, we kill trillions of insects per year in insect farms and quadrillions per year with insecticides.<sup>34</sup>

Fourth, consider microscopic invertebrates, such as nematodes. On one hand, nematodes have very simple nervous systems, with only a few hundred neurons each, and it seems plausible that more is needed for conscious experience. On the other hand, it seems at least possible that a simple nervous system with a few hundred neurons is sufficient for conscious experience. Additionally, nematodes still pursue positive stimuli and avoid negative stimuli, and they still share an evolutionary history with other animals who might be sentient.<sup>35</sup> In my view, this adds up to a low, but non-zero, probability that nematodes are sentient given current evidence. And the stakes are once again very high, since, according to one estimate, nematodes have more neurons in the aggregate than any other kind of animal.<sup>36</sup>

Fifth, consider plants (along with animals that lack neurons, such as sponges). The current prevailing view among scientists and philosophers is that plants are non-sentient. This view makes sense, since plants are much less active than animals, and they have no brains or neurons. At the same time, plants are more active than many humans realize; for instance, they have the capacity for perception, learning, memory, communication, and behavior. And they do have nervous systems of sorts, even if their nervous systems are very different from ours.<sup>37</sup> In my view, this once again adds up to a low, but non-zero, probability that plants are sentient given

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<sup>33</sup> Ries et al 2017.

<sup>34</sup> Byrne 2021, Howe 2019. For examples of people who extend moral consideration to invertebrates such as arthropods, see Horta 2010, Ng 1995, and Tomasik 2015.

<sup>35</sup> Hobert 2010.

<sup>36</sup> Ray 2017.

<sup>37</sup> Wohlleben 2016.

current evidence. And the stakes are once again very high, since plants have an estimated 80% of all biomass on the planet, and we kill them in very high quantities as well.<sup>38</sup>

Finally (for now), consider parts and wholes. We tend to think of *organisms* as sentient, but is it possible that sentience can arise within and across organisms as well? For instance, is it possible that each octopus brain is a separate moral subject, in addition to the octopus as a whole being a moral subject? Similarly, is it possible that an insect colony is a separate moral subject, in addition to each insect being a moral subject? We are only at the start of asking these questions, much less answering them. But if we are open to the idea that sentience can take different forms, including relatively centralized and distributed forms, then we should be open to the idea that parts and wholes can be sentient and have moral status at the same time. I have no idea what might follow for morality, but this question is worth keeping in mind.<sup>39</sup>

Of course, I am not suggesting that these examples are all alike. Some of these beings are much more likely to be sentient than others. And some of these beings, if sentient, likely have a much higher capacity for welfare than others. So a lot will depend on how we assess risk in general. If we think that we should consider all risks, no matter how small, then we might think that we should extend moral consideration to anyone who might be sentient. In contrast, if we think that we should consider all “non-negligible” risks but that we can permissibly ignore “negligible” risks, then we might think that we should extend moral consideration to anyone with a “non-negligible” chance of being sentient and that we can permissibly ignore anyone with only a “negligible” chance of being sentient, to the degree that we accept sentientism.

Either way, a very strange moral future awaits us. Many humans still resist the idea that vertebrates such as cows, pigs, chickens, and fishes have moral status. But if we continue to

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<sup>38</sup> Bar-On et al 2018.

<sup>39</sup> For discussion of the possibility that parts and wholes can be sentient at the same time, see Block 1975.

make moral and scientific progress, then future generations will take it for granted that all these animals have moral status, and the more interesting question will be whether to extend moral consideration to, say, arthropods, nematodes, plants, or parts or collectives of these beings. I have no idea how to answer this question, but I find it plausible that our successors will extend moral consideration to some of these beings, either because they accept that sentience might be unnecessary for moral status or because they accept that some of these beings might be sentient. As a result, I think that we should take these possibilities seriously now as well.

#### 4. Practical changes

We should also expand the scope of our moral community substantially for practical reasons. In particular, human activity is changing the world in two related ways that will increase the number and variety of beings to whom we can have moral duties. First, humans are creating new beings, including biological beings such as chimeras and artificial beings such as complex artificial intelligences.<sup>40</sup> Insofar as these beings might be sentient, we should treat them as having moral status. And insofar as they have a wider range of interests and needs than animals do now, we should treat them as having a wider range of rights than we treat animals as having now. There are already more selectively bred nonhumans than humans on the planet. In the future, both the number and variety of such beings will likely increase substantially.

Second, humans are impacting a wider range of beings on the planet, individually as well as collectively. As our economic systems globalize and our technological systems advance, we

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<sup>40</sup> For discussion of chimeras, see Hyun 2016. For discussion of artificial intelligences, see Gunkel 2018.

are increasingly impacting countless individuals across nations, generations, and species through our everyday behavior.<sup>41</sup> Thus, not only will there be more beings with moral status in the future, but there will also be more beings with moral status whose interests and needs we have a responsibility to consider. In the past, our primary responsibilities might have been to humans and nonhumans in our local community. But in the future, our primary responsibilities might increasingly be to humans and nonhumans in our global community, which might change many of the requirements of morality in fundamental ways.

Consider each of these practical changes in turn. First, humans are creating new beings. We already create new beings all the time through selective breeding. We breed farmed animals to grow as big as possible as quickly as possible. We breed lab animals to have diseases that are relevant to our research interests. We breed companion animals to have features that humans regard as cute, such as large eyes and compressed noses. This practice raises questions about the ethics of selective breeding. Can this practice ever be acceptable, and, if so, when? It also raises questions about the moral status of selectively bred animals. Insofar as we intentionally created these animals, do we have special duties to them accordingly? And, insofar as they have different interests and needs, do we have different duties to them accordingly?<sup>42</sup>

We are also, increasingly, creating new beings through genetic modification. This includes creating chimeras who have genes from multiple species, including humans. This practice raises all the same questions as selective breeding, along with additional questions. For example, if we create an animal who has some human genetic material and some chimpanzee genetic material, should they have the same moral status as humans? Should they have the same moral status as chimpanzees? Should they have a new, in-between moral status? Of course,

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<sup>41</sup> For discussion of the Anthropocene, see Moore 2016 and Sebo 2022.

<sup>42</sup> For more, see Ormandy et al 2011.

insofar as we see humans and chimpanzees as having a similar moral status, this question is unimportant. But insofar as we see humans and chimpanzees as having different moral statuses, as most researchers currently do, this question is profoundly important.<sup>43</sup>

Humans are also creating artificial beings who might one day have moral status. We already share the world with a wide range of relatively simple artificial intelligences. We have robots that can provide us with labor and companionship. We have computer programs that can beat us at board games. We have avatars that can talk or fight with us in video games. In many cases, we then treat these beings in ways that would be clearly unacceptable if they were sentient (and might even be unacceptable otherwise). How should we morally evaluate this behavior? Granted, we might be confident that these artificial beings are non-sentient right now. But can we be certain that they are? Even if so, should we remain certain, or even confident, that all of these beings will remain non-sentient as these technologies advance?<sup>44</sup>

Whether we are considering artificial beings with relatively centralized intelligence, such as robots, or with relatively distributed intelligence, such as networks, there will likely come a point where we morally ought to treat them as sentient. As with new kinds of biological beings, this will raise many further questions. In the same way that we already create many more nonhumans than humans, we have the potential to create many more artificial beings than biological beings (given the possibilities available to us in digital space). And in the same kind of way that there is much more variety across than within species, we have the potential to create much more variety in artificial beings than in biological beings. Thus, the act of creating these beings might increase both the size and diversity of our moral community substantially.

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<sup>43</sup> Hyun 2016, Robert and Baylis 2003.

<sup>44</sup> For discussion of the prospect of advanced artificial intelligence, see Bostrom 2014.

In addition to creating more beings who either will or, at least, might have moral status, we will also be impacting many more beings as well. Many scientists believe that we now live in the Anthropocene, a new geological epoch defined primarily in terms of the impacts of humanity on the planet. Through deforestation, the wildlife trade, factory farming, industrial fishing, and other such activities, humans are radically reshaping the planet. In particular, we are reshaping the planet directly, by converting natural spaces into artificial spaces, and harming, killing, or otherwise impacting many human and nonhuman animals in the process. We are also reshaping the planet indirectly, by contributing to pandemics, climate change, and other global threats that have the potential to impact humans and nonhumans all around the world.<sup>45</sup>

These and other activities place us in what Steven Gardiner calls a perfect moral storm. First, they connect us across space and time. Much of what we do places us in social, political, and economic entanglements with people in other nations and generations. Many of these entanglements involve deep inequities. For example, high-income humans in industrialized nations are disproportionately responsible for global threats such as climate change, yet low-income humans in non-industrialized nations and future generations will be disproportionately impacted. These impacts raise important questions about global ethics and politics. Plausibly, insofar as we either intentionally or foreseeably harm people in other nations and generations, we have a moral duty to those individuals to attempt to reduce and repair those harms.<sup>46</sup>

Second, these and other impacts connect us across species. As we have seen, humans are already intentionally harming and killing more than 100 billion captive animals and more than 1 trillion wild animals each year for food. We are also already foreseeably harming and killing many more nonhuman animals each year through deforestation, development, and other such

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<sup>45</sup> Sebo 2022.

<sup>46</sup> Gardiner 2013.

activities. Moving forward, human-caused global changes will have similarly pervasive impacts on wild animal populations; for instance, climate change will cause rising temperatures, rising sea levels, flooding coastal regions, an increase in the frequency and intensity of extreme weather events, and more. Thus, we must ask questions about global ethics and politics with all impacted stakeholders, not merely humans, in mind.<sup>47</sup>

Third, these impacts flow from our collective behavior more than from our individual behavior. In many cases, we are not individually harming individuals in other nations, generations, or species, but are rather participating in collective actions that harm these individuals. Additionally, in many cases the causal chains that start with our collective actions and end with these international, intergenerational, multi-species harms are long and difficult if not impossible to trace. This raises or, at least, amplifies, important questions about responsibility. How should we assess individual responsibility in such cases? When deciding how to treat others, should we focus primarily on individual and relatively measurable impacts, or should we focus on collective and relatively unmeasurable impacts as well?<sup>48</sup>

When we combine these epistemic and practical changes together, the result is likely to be a substantial expansion of our moral community. Human activity is already impacting trillions of possibly sentient beings each year. The more we expand the number and variety of possibly sentient beings in the world, and the more we expand our power to impact these beings across nations and generations, the more we will expand the scale of morally relevant human impacts in the world. Simply put, if we accept that sentience is sufficient for moral status and that we should treat beings as sentient in cases of uncertainty, then we will soon have to accept that we

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<sup>47</sup> For discussion of human complicity in biodiversity loss in the Anthropocene, see Kolbert 2021.

<sup>48</sup> For discussion of the need to move beyond individual ethics in the Anthropocene, see Jamieson 2014.

have a moral responsibility to consider the interests of *quintillions* of possibly sentient beings, including biological as well as artificial beings.

Another result of these changes is likely to be an increased focus on collective ethics, in two respects. First, we will need to focus more on collective responsibilities. Insofar as the most important harms in the world are harms that we cause together, we will need to accept responsibility for these harms together. Second, we will also need to focus more on collective, or at least distributed, rights. Insofar as the most important harms in the world accrue to members of other species, nations, and generations, we might need to attend to these harms primarily as populations, since it might be impossible to attend to them primarily as individuals. And insofar as many of these beings will be part of distributed cognitive networks, we might need to assign these networks not only instrumental but also intrinsic moral status.

These changes in our moral predicament might also have important consequences for moral theories, including consequentialist and non-consequentialist theories. Consider consequentialist theories. According to consequentialist theories such as utilitarianism, our moral obligation is to do the most good possible by any means necessary. Thus, in theory, we should decide what to do by estimating the impacts of each possible action, and then selecting the action that will do the most good in the aggregate, on expectation. At least in theory, then, utilitarianism is highly demanding, since it implies that we should do the most good possible. Moreover, at least in theory, utilitarianism is not at all restrictive, since it implies that if harming or killing others is necessary for the greater good, then we should do it.<sup>49</sup>

However, given the scope of suffering in the world and our epistemic and practical limits, we might not always be able to meet this standard in practice. After all, we might not always (or

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<sup>49</sup> For discussion of this kind of moral theory, see Driver 2007, Chapters 3-4.

ever) be able to reliably estimate what will do the most good possible, and even if we could, we might not have the motivation that we need to act on this information.<sup>50</sup> If so, then we might need to engage in at least some non-consequentialist reasoning in practice. For instance, we might need to follow at least a somewhat less demanding moral framework in practice, so we can promote good impacts sustainably. We might also need to follow at least a somewhat more restrictive framework in practice, since a default norm of following rules, respecting rights, and cultivating virtuous characters is likely to do a lot of good in the long run.<sup>51</sup>

Similarly, consider non-consequentialist theories. According to non-consequentialist theories such as rights theory, virtue theory, and care theory, our moral obligation is not to do the most good possible. Instead, we are permitted to pursue our own goals in life, provided that we respect the rights of others, cultivate virtuous character traits, or cultivate relationships of care along the way. Granted, there can be exceptions. For instance, if we harm someone, then we might have a duty to help them as a way of reducing or repairing that harm. We might also have a duty to help others in emergency situations, as well as a right to harm others in self-defense, other-defense, or even, on some views, for the sufficiently greater good. But beyond that, non-consequentialism is relatively undemanding and restrictive.<sup>52</sup>

However, given the scope of suffering in the world and our increasing complicity in this suffering, we might still have a relatively strong and general duty to reduce suffering in practice, including, in some cases, through ordinarily unacceptable means. For instance, while we might not have a duty to reduce *natural* wild animal suffering according to this view, we might still have a duty to reduce *human-caused* wild animal suffering in some cases.<sup>53</sup> And in a world

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<sup>50</sup> For discussion of this view, see Hare 1981 and Sidgwick 2011/1874.

<sup>51</sup> For more, see Sebo 2022, Chapter 2.

<sup>52</sup> For discussion of this kind of moral theory, see Driver 2007, Chapters 6-7.

<sup>53</sup> For discussion of this view, see Palmer 2021.

reshaped by deforestation, development, pandemics, climate change, and other such forces, an increasing amount of wild animal suffering will be at least partly, if not fully, human-caused. Thus, non-consequentialists might need to start thinking in consequentialist terms more, both to assess their complicity and to address their complicity.<sup>54</sup>

As a result, I think that consequentialist and non-consequentialist theories will at least partly converge on a shared moral framework in the future. According to this shared moral framework, we have a duty to reduce harm in the world where possible, either because we have a duty to prevent harm (on the consequentialist version) or because we have a duty to reduce and repair harms that we cause (on the non-consequentialist version). While these consequentialist and non-consequentialist views might be different in theory, they will be increasingly similar in practice, since the line between natural harms and human-caused harms will be increasingly hard to draw. So, no matter which view we accept, we will likely have a collective responsibility to ethically and effectively address an increasingly high amount of harm in the world.

The upshot is that the future of moral status is likely to be very strange indeed, both because we should extend some moral consideration to a much wider range of beings, and because we should accept our complicity in what happens to a much wider range of beings. At a minimum, this includes all vertebrates and many invertebrates, ranging from mollusks to arthropods. It might also include nematodes, plants, artificial intelligences, and many other beings whose lives are shaped by human activity. In short, we will have placed ourselves in a situation where we are accountable to quintillions of beings who at least might have moral status (either because they might be sentient or because sentience might be unnecessary for moral status), and we will have to comport to that situation as best we can.

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<sup>54</sup> For discussion of this view, see Sebo 2022, Chapter 2.

## 5. References

Anderson, Elizabeth. 2004. "Animal Rights and the Values of Nonhuman Life," in Cass Sunstein and Martha Nussbaum, eds, *Animal Rights: Current Debates and New Directions*. Oxford: Oxford University Press: 277-298.

Andrews, Kristin. 2015. *The Animal Mind: an Introduction to the Philosophy of Animal Cognition*. New York, NY: Routledge.

Andrews, Kristin; Comstock, Gary L; Crozier, G.K.D.; Donaldson, Sue; Fenton, Andrew; John, Tyler M; Johnson, Syd M; Jones, Robert C; Kymlicka, Will; Meynell, Letitia; Nobis, Nathan; Pena-Guzman, David; and Sebo, Jeff. 2018. *Chimpanzee Rights: the Philosophers' Brief*. New York, NY: Routledge.

Yinon M. Bar-On, Rob Phillips, and Ron Milo. 2018. "The biomass distribution on Earth," PNAS 115 (25): 6506-6511.

Bentham, Jeremy. 2007/1780. *An Introduction to the Principles of Morals and Legislation*. Mineola, Dover Publications.

Block, Ned. 1975. "Troubles with Functionalism," *Minnesota Studies in the Philosophy of Science* 9:261-325.

Bostrom, Nick. 2014. *Superintelligence*. Oxford: Oxford University Press.

Brody, Baruch. 2012. "Defending Animal Research: An International Perspective," in Jeremy R. Garrett, *The Ethics of Animal Research: Exploring the Controversy*. Cambridge: MIT Press, 2012: 53-66.

Byrne, Jane. 2021. "Demand for Insect Protein Could Hit 500,000 tons by 2030," [feednavigator.com: https://www.feednavigator.com/Article/2021/02/24/Demand-for-insect-protein-could-hit-500-000-tons-by-2030](https://www.feednavigator.com/Article/2021/02/24/Demand-for-insect-protein-could-hit-500-000-tons-by-2030)

Carruthers, Peter. 1992. "Contractualism and animals," in *The Animals Issue*. Cambridge: Cambridge University Press.

Donaldson, Sue, and Kymlicka, Will. 2011. *Zoopolis: a Political Theory of Animal Rights*. New York, NY: Oxford University Press.

Driver, Julia. 2007. *Ethics The Fundamentals*. Malden, MA: Blackwell Publishing.

Eisemann, C. & Jorgensen, W. & Merritt, David & Rice, Martin & Cribb, Bronwen & Webb, P. & Zalucki, M. 1984. "Do insects feel pain? — A biological view." *Experientia*. 40. 164-167. 10.1007/BF01963580.

Gardiner, Stephen M. 2013. *A Perfect Moral Storm: the Ethical Tragedy of Climate Change*. New York, NY: Oxford University Press.

Godfrey-Smith, Peter. 2016. *Other Minds*. New York: Macmillan Publishers.

Goodpaster, Kenneth E. 1978. "On Being Morally Considerable," *The Journal of Philosophy* 75:6J: pp. 308-325.

Gruen, Lori. 2015. *Entangled Empathy*. New York: Lantern Press.

Gunkel, David J. 2018. *Robot Rights*. Cambridge: The MIT Press.

Hare, R.M. 1981. *Moral Thinking: Its levels, method, and point*. Oxford: Oxford University Press.

Hobert, Oliver. 2010. "Neurogenesis in the nematode *Caenorhabditis elegans*," WormBook: <https://www.ncbi.nlm.nih.gov/books/NBK116086/>

Horta, Oscar. 2010. "Debunking the Idyllic View of Natural Processes: Population Dynamics and Suffering in the Wild," *Telos: Revista Iberoamericana de Estudios Utilitaristas*: 73-90.

Howe, H. J. B. 2019. "Improving Pest Management for Wild Insect Welfare," Wild Animal Initiative: <https://static1.squarespace.com/static/5f04bd57a1c21d767782adb8/t/5f33600614f683319474f84e/1597202439896/Improving%2BPest%2BManagement%2Bfor%2BWild%2BInsect%2BWelfare.pdf>

Hyun, Insoo. 2016. "Illusory Fears Must Not Stifle Chimaera Research," *Nature* 537, 281.

Jacquet, Jennifer; Franks, Becca; and Godfrey-Smith, Peter. 2019. "The octopus mind and the argument against farming it." *Animal Sentience* 26:19.

Jamieson, Dale. 2008. *Ethics and the Environment*. Cambridge: Cambridge University Press.

Jamieson, Dale. 2014. *Reason in a Dark Time: Why the Struggle against Climate Change Failed - and What It Means for Our Future*. New York: Oxford University Press.

Kagan, Shelly. 2019. *How to Count Animals, More or Less*. Oxford: Oxford University Press.

Kolbert, Elizabeth. 2021. *Under A White Sky*. New York: Penguin Random House.

Leopold, Aldo. 1949. *A Sand County Almanac*. Oxford: Oxford University Press.

Kant, Immanuel. 2012/1785. *Groundwork of the Metaphysics of Morals*, ed. Mary Gregor and Jens Timmermann. Cambridge: Cambridge University Press.

Korsgaard, Christine. 1983. "Two Distinctions in Goodness," *The Philosophical Review* 92:2: 169-195.

MacAskill, William; Bykvist, Krister; and Ord, Toby. 2020. *Moral Uncertainty*. Oxford, Oxford University Press.

Moore, Jason W., ed. 2016. *Anthropocene or Capitalocene: Nature, History, and the Crisis of Capitalism*. Oakland: PM Press.

Ng, Yew-Kwang. 1995. "Towards welfare biology: Evolutionary economics of animal consciousness and suffering," *Biology and Philosophy* 10: 255-285.

Nozick, Robert. 1974. *Anarchy, State, and Utopia*. New York: Basic Books.

Ormandy, E. H., Dale, J., & Griffin, G. 2011. "Genetic engineering of animals: ethical issues, including welfare concerns." *The Canadian veterinary journal = La revue veterinaire canadienne*, 52(5), 544-550.

Palmer, Clare. 2010. *Animal Ethics in Context*. New York: Columbia University Press.

Palmer, Clare. 2021. "Assisting Wild Animals Vulnerable to Climate Change," *Journal of Applied Philosophy* 38:2: 179-195.

Raji, JI, and Potter, CJ. 2021. "The number of neurons in *Drosophila* and mosquito brains," *PLoS ONE* 16(5): e0250381.

Ray, Georgia. 2017. "How many neurons are there?" *Eukaryote Writes Blog*: <https://eukaryotewritesblog.com/how-many-neurons-are-there/>.

Regan, Toom. 1983. *The Case for Animal Rights*. Berkeley: University of California Press.

Ries, AS; Hermanns, T; Poeck, B; et al. 2017. "Serotonin modulates a depression-like state in *Drosophila* responsive to lithium treatment." *Nature Communications* 8: 15738.

Robert, Jason Scott, and Baylis, Françoise. 2003. "Crossing species boundaries," *American Journal of Bioethics* 3.3, 1-13.

Sachs, Benjamin. 2011. "The status of moral status," *Pacific Philosophical Quarterly* 92:1, 87-104.

Sanders, Bas. 2020. "Global animal slaughter statistics and charts: 2020 update," *Faunalytics*: <https://faunalytics.org/global-animal-slaughter-statistics-and-charts-2020-update/>

Schlottmann, Christopher and Sebo, Jeff. 2018. *Food, Animals and the Environment: an Ethical Approach*. New York: Routledge.

Schweitzer, Albert. 1929. *Civilization and Ethics*. New York: A & C Black Ltd.

Sebo, Jeff. 2022. *Saving Animals, Saving Ourselves*. New York: Oxford University Press.

Sebo, Jeff. 2018. "The Moral Problem of Other Minds," *The Harvard Review of Philosophy* 25: pp. 51-70.

Sidgwick, Henry. 2011/1874. *The Methods of Ethics*. Cambridge: Cambridge University Press.

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

Singer, Peter. 2011. *The Expanding Circle: Ethics, Evolution, and Moral Progress* (Princeton, NJ: Princeton University Press.

Tomasik, Brian. 2015. "The importance of wild animal suffering," *Relations* 3:2, 133-152.

Wohlleben, Peter. 2016. *The Hidden Life of Trees: What They Feel, How They Communicate: Discoveries from a Secret World*. Vancouver: Greystone Books.

Low, P., Panksepp, J., Reiss, D., Edelman, D., van Swinderen, B., & Koch, C. 2012. *The Cambridge Declaration on Consciousness*. Presented at the Francis Crick Memorial Conference, Cambridge, England.