

Review



Animal flourishing in a time of ecological crisis I

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Abstract

Three new books by Martha Nussbaum, Jeff Sebo, and Mark Rowlands seek to raise the profile of non-human animals within political theory. They present a series of compelling arguments for making animal flourishing central to discussions about the future, especially in a time of ecological crisis. All three offer important insights into what a genuinely non-anthropocentric political theory could look like. But while they converge in some ways — for instance, all recommend serious restrictions on the human industries that brutalise other animals — they also paint quite different visions of the proper relationship between humans and other animals. This review essay assesses their distinctive visions of the future of human-animal relations.

Keywords

Animals, ecological crisis, the wild, factory farming, deforestation

Given their ubiquity on our planet, non-human animals still receive far too little attention within the annals of political theory. Three new books by Martha Nussbaum, Jeff Sebo, and Mark Rowlands seek to raise their profile. They present a series of compelling arguments for making animal flourishing central to discussions about the future, especially in a time of ecological crisis. All three offer important insights into what a genuinely non-anthropocentric political theory could look like. But while they converge in some ways – for instance, all recommend serious restrictions on the human industries that brutalise other animals – they also paint quite different visions of the proper relationship between humans and other animals. One of the key issues at stake is whether the

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proper relationship between humans and other animals should be much a closer one – albeit with humans in the driving seat, in Nussbaum's vision – or one in which our power over other animals is reduced.

We will begin by examining Nussbaum's argument for making animal flourishing a central concern of justice. Her focus is for the most part on protecting the interests of individual animals, but her arguments are also informed by a hope that animals might progressively move from the margins into an interspecies society grounded on justice and peaceful coexistence. In stark to contrast to recent defences of 'rewilding,' Nussbaum sees the notion of the wild as an anachronism and a distraction; humans and animals are stuck with one another, and the best course to take is to acknowledge this fact and to use the power humans inevitably possess over other animals judiciously. Sebo and Rowlands, meanwhile, also want to look holistically and structurally at the place of animals – and the human industries that exploit, degrade, and consume them – in our societies. Sebo provides a systematic account of what it would take to integrate a concern with animals into political theory, and into our everyday politics. He suggests that a cleareyed view of the threats posed by pandemics and climate change speaks in favour of significant restrictions on factory farming, deforestation, and the wildlife trade, although these are but some of the themes discussed in a rich and complex book. Those arguments suggest our main priority ought to be to reduce the human impact on animals, but Sebo is also prepared to endorse positive duties towards them, whether domesticated or not. As a result, the stance on whether our relationship with animals should be closer or more distant is quite nuanced. Rowlands's book focuses somewhat more single-mindedly on a future in which factory farming is eliminated and much of the world is given over to forests. In this vision - by contrast to Nussbaum's - animals are not so much welcomed into the bosom of human society as liberated from it.

Animals, capabilities, and the wild

Martha Nussbaum's Justice for Animals: Our Collective Responsibility seeks to guarantee for non-human animals the status of full subjects of justice. Any entity can be a subject of justice, she argues, if it possesses a standard package of characteristics: "sentience, emotion, cognitive awareness of objects, movement towards the good and away from the bad" (Nussbaum 2022: 138). All mammals, fish, birds, cephalopods, probably all reptiles, and possibly crustaceans fit under this description, she suggests, though it is unlikely to cover insects, and highly unlikely to include sponges, jellyfish, and so forth. The account focuses on the flourishing of individual creatures; species matter only instrumentally if at all, from the moral point of view, whereas each individual animal is "a teleological system directed towards a set of good ends" (p. 96). There are many ways in which we can thwart individual striving, however, and justice is about interrogating and, where possible, removing those impediments to flourishing. Nussbaum is keen to present her account as thoroughly non-anthropocentric in character: the Capabilities Approach should not simply identify human capabilities and help itself to the assumption that animal capabilities must be broadly similar. Nevertheless, in developing the implications of that approach for animals, Nussbaum does take her familiar list of human

capabilities as a starting point. This is legitimate, she now claims, because that list was originally generated not by thinking about what is distinctively human, but rather by thinking through the nature of animality (pp. 102–3).

The Capability Approach is formally egalitarian in the sense that it demands that normatively relevant interests are treated similarly, regardless of species membership. But the substantive egalitarianism of the account is limited in two ways. First, members of different species tend to differ in their capacities. Individuals from more mentally complex species, for instance, are likely to have more capabilities in need of protection, and hence may place more demands on policymakers. Second, Nussbaum's version of the Capabilities Approach aims not to equalise or maximise flourishing, but rather to secure a threshold level of protection for each capability. This second move is partly explained, perhaps, by the fact that Nussbaum wants the Approach to function as a 'political' conception of justice, capable of inhabiting an overlapping consensus among a number of different, but reasonable, comprehensive doctrines (pp. 93–5). Egalitarianism for animals – or indeed for humans – might be too controversial to do that.

What is the likely upshot of Nussbaum's Capability Approach for our laws, or for our most important socio-economic practices? One prominent implication is that since most animals raised for food are killed in painful and traumatic ways, this is an injustice which should be prevented by law. Trickier cases concern 'humanely-raised' animals, who are subjected to relatively painless killing (p. 155). Here much depends, Nussbaum argues, on whether these animals have temporally extended projects (plans or desires which suggest a sense of both past and future). Nussbaum believes that individual primates, elephants, whales, cows, pigs, dogs, cats, and horses do have such projects, and that for this reason, it would be wrong for us to kill them for food (p. 167). This suggests serious limits on factory farming. Taking animal flourishing seriously also means including them, whether directly or by proxy, in our decision-making processes. For instance, animals ought to have legal standing, though in practice this likely means allowing human activists to represent them in the courtroom. The flip side of this inclusion is that animals can be subjected to moral strictures and to the law. For instance, Nussbaum suggests that cats should learn not to chase birds, and that companion animals have moral duties not to urinate or defecate in inappropriate places, and that they can and should be cited by the law when they do so (p. 206).

Nussbaum's is one of the best-developed, and most elegantly argued, accounts of animal justice that we possess. But I found many of the judgements about individual cases puzzling. For instance, she argues that whereas killing a cat would represent an injustice, we cannot say the same about a fish killed painlessly amid an otherwise thriving life (p. 168). Some would claim that eating fish involves treating them in a highly instrumental way, and not as ends in themselves. Nussbaum denies that (p. 170), but I didn't find the argument satisfying on this point. Given that she rules out the hunting of land animals as an illegitimate example of treating animals as mere ends, why excuse fishing? The issue cannot turn on different propensities for pain, because the best evidence suggests fish do feel pain (Sneddon, 2019), and in any case, we could come up with painless forms of hunting if we tried. The point about merely instrumental treatment seems to apply across both cases. Within the same discussion, she also suggests that

humane fish farming represents a big step forward for fish (Nussbaum 2022: 172), despite considerable evidence of not only the dreadful environmental consequences of industrial fish farming, but also its terrible toll on captive fish (who lead crowded, unhealthy, stressful and surely non-flourishing lives).

This view about fish farming could be treated as an isolated solecism, but in fact, it seems to be connected to a wider view about the desirability – and perhaps the inevitability - of a transition into human stewardship. Forget romantic defences of 'the wild': there is no place on the planet, Nussbaum suggests, "that is not controlled by humans" already, and as a result, the notion of the wild is really just a way of abdicating responsibility for nature (p. 224). We could quibble with this as a descriptive claim (there is surely no meaningful sense in which the deep sea is under human control, even if we are having an environmental impact on it), but I am more interested in the prescriptive conclusion Nussbaum wants to draw, which is that since the idea of the wild is a red herring, humans simply have to embrace a directing role over the whole earthly environment. Since life in so-called wild places is so challenging, animals themselves would probably choose a life of enlightened human stewardship if they could, she thinks: "freedom and autonomy for animals are not incompatible with intelligent human stewardship. Indeed, they typically require stewardship" (p. 231). This view explains some of the surprising judgements to be found in the pages of the book, including the claim that life as a farmed fish is probably better than the alternative. We also hear that it's unethical to let a pet cat outside, in light of the dangers it will face (pp. 214-5). If we liberated cats or dogs, not only their lives but the lives of any eventual descendants would be miserable ones (p. 197).

Ultimately, the reader could accept the bulk of Nussbaum's conceptual architecture while exercising caution with regard to her practical judgements on what is likely to be most conducive to animal flourishing. The reader will form his or her own judgement about those practical questions – for me, the embrace of human control is both troubling, and a surprising place to end up if one's starting point is the need to protect the distinctive forms of flourishing of members of different species. For it seems to be unlikely that animals' best lives will repeatedly turn out to be best served by, or even compatible with, a life under human stewardship. There seemed to me to be a tension, therefore, between the focus on protecting individual flourishing, in which all animals are able to live the kinds of lives distinctive to their species, and her commitment to a multi-species society in which humans have such a strong directing role.

It is certainly striking how Nussbaum seeks to force the argument. What we call natural ecosystems only actually sustain themselves, she claims, by way of human intervention (p. 227). She maintains, for instance, that "There would be no rhinos or elephants left in the world if humans did not intervene" (p. 228); by this she means, presumably, that they would go extinct without humans willing to patrol protected areas. This rather deflects attention from the fact that the chief threats to both species are habitat loss, climate change, and the wildlife trade, for all of which humans are the culprits. Given her focus on individual flourishing, one might also expect Nussbaum to rule out keeping sentient animals in zoos more definitively than she does. On the contrary, she implies that at least some forms of confinement might be permissible if we learn more

about animals as a result (p. 240). This argument also sounds an awful lot like using individual animals as mere means to others' ends, and the kind of thing an individualist Capabilities Account ought to rule out. Nussbaum's surprising response to worries about confinement is to declare that the whole modern world already confines animals, and that if we reject confinement we would therefore have to reject that world in its entirety (p. 242). This rhetorical sledgehammer prevents a more nuanced conversation about when and why confinement is permissible: to accuse anyone who argues against specific acts of animal confinement of wanting to abolish human civilisation is to stop that discussion in its tracks.

Protecting animals (and ourselves) in a time of pandemics and climate change

Jeff Sebo argues not only that many acts of animal confinement are impermissible, but that they are likely harming us as well as their animal victims. His book *Saving Animals, Saving Ourselves: Why Animals Matter For Pandemics, Climate Change, and Other Catastrophes* suggests that our treatment of animals has now brought humanity to the brink of a moral superstorm. People currently kill over 100 billion animals per year through factory farming, and anywhere between 1 and 3 trillion animals annually through industrial fishing (Sebo 2022: 42). But these practices are now exposing us to serious, and possibly existential, risks. One fact that Nussbaum's account rather neglects is that as we have extended the human footprint into previously wild habitats, we have facilitated the spread of zoonotic diseases, to devastating effect. Both deforestation and the wildlife trade have in that sense had hugely negative implications for human health. So too has factory farming, which serves as a biological reservoir for the pandemics of the future. These practices, then, are bad for both animals and humans.

If pandemics represent one of the framing crises of Sebo's book, climate change is the other. Climate change is endangering the health of many human beings, as well as both domesticated and wild animals. Here too the problem is exacerbated by processes of deforestation as well as factory farming. One of the key claims of the book is that we will not tackle problems such as pandemics and climate change without thinking collectively, structurally, and holistically about possible solutions. For instance, there is no way to meaningfully slow (much less stop) deforestation, Sebo suggests, without at the same time reining in animal agriculture (p. 49). Another reason for thinking holistically is that "all oppressions, human as well as nonhuman, have shared conceptual, social, political, and economic foundations" (p. 188). More specifically, limits on factory farming, deforestation, and the wildlife trade recur frequently throughout the book as promising policies for anyone who cares about both human and animal health and well-being. The problem is that we have shown little inclination so far to take the measures that would protect ourselves and other animals from the large-scale risks of the future. Pandemics and climate change are "interspecies, international, and intergenerational collective action problems, where all have an incentive to be part of the problem rather than part of the solution" (p.8). It is no surprise, then, that our responses to date have been wholly insufficient.

Sebo aims to show not only that policies restricting factory farming, deforestation and the wildlife trade are promising responses to the crises we face, but that a variety of philosophical views can find solid reasons for endorsing those policies. Specifically, he wants to identify areas of overlap between animal-friendly consequentialism on the one hand, and animal-friendly rights theories on the other. Of course, there are differences between those two approaches. For instance, consequentialism might recommend that we assist animals whenever we can do so at reasonable cost, whereas rights theories might merely tell us to avoid harming animals (or repair any harms we have done to them), rather than embracing positive duties to assist them in leading better lives. Nevertheless, one of the book's key (and perhaps most contentious) arguments is that in the Anthropocene era this distinction blurs, with the two views converging to a large extent in their practical implications. Humanity is already having a massive impact on the world around us, infringing the rights of animals everywhere. For that reason, an animal-friendly rights theory may now be just as demanding in its implications as consequentialism. On both accounts, Sebo suggests, we should take more care to harm animals only in cases of self-defence or other-defence (p. 125), and we should embrace positive duties to help animals, both because of the good we can do for them, and because of our implication in the harms they face. (Of course, even having cleared the way for according to moral status to animals, much will depend on exactly what kind of moral status humans are prepared to give them. Should we be egalitarian about animals' interests? Or can we embrace a hierarchical view, which would give greater consideration to humans simply because they are humans? Sebo does not try to defeat the hierarchical view, but he does note that a moderate version of it will also lend itself to the conclusion that animal suffering is massive, neglected, and tractable in a whole series of ways).

Like Nussbaum, Sebo focuses on sentient animals, though he is open to the idea that all living beings (and even artificial beings, like suitably advanced AI) might have moral status (p. 102). Unlike her, he suggests that we might need to extend the moral circle to insects, because there is a non-negligible chance that they possess some capacity for positive and negative well-being, and they also have some chance of passing the test of sentience (p. 184). But there is a great deal of uncertainty here, and a strong chance our moral reasoning will go astray: in the past, powerful groups' resistance to extending moral status to marginalised groups has frequently exemplified motivated reasoning, and suffered from cognitive biases; perhaps our contemporary judgements about AI or about insects do the same. Likewise, his book also explores the idea of legal protections, and political representation, for individual animals - in fact, it goes further than Nussbaum's by giving serious consideration to the participation of animals in politics, rather than their representation (p. 137). Sebo recommends that research and advocacy should explicitly include animals much more than they currently do, especially when it comes to health and environmental policy. He sketches a possible pro-animal coalition that could emerge in contemporary politics, focused on the way our treatment of animals harms both them and us, and which could include animal rights groups, human rights groups, and environmental protection groups (p. 117). Because Sebo wants his account to be relatively uncontroversial, however, he sometimes pulls his

punches. For instance, he suggests that the institutions of liberalism, democracy, and capitalism may all need rethinking in light of the environmental problems we face. It would have been interesting to see these arguments developed further.

Sebo does sometimes offer glimpses of the bigger picture: like Nussbaum, he wants us to construct "a just multispecies society" (p. 199), in which humans and other animals can flourish harmoniously. But he also admits to a great deal of uncertainty about what a just future would look like, especially given difficult questions in population ethics (which are made even more difficult once we take animals' interests seriously), and uncertainty about the sentience of some animals. One section is entitled, rather disarmingly, "We have no idea what kind of world to build for animals." His claims about the Anthropocene suggest that, like Nussbaum, Sebo will be suspicious of any neat division between the human and the natural – unlike Nussbaum, he is content to use the term wild to describe animals whose lives are relatively untouched by us, but his arguments about the Anthropocene suggest that relatively few animals will qualify as fully wild. But does his view imply, like Nussbaum's, that it would be desirable to transform wild ecosystems, so as to reduce or eliminate animal suffering? This appears to be an issue where the difference between consequentialist and deontological views could matter a good deal: consequentialist views are likely to see the distinction between domesticated and wild animals as normatively rather uninteresting, and ask instead whether it is in practice possible to help wild animals at reasonable cost. Deontologists, by contrast, might place more store on the causes of wild animal suffering, and perhaps on respecting the autonomy of wild animals. The advent of climate change brings those positions closer together, but it does not close the gap entirely. Sebo seeks to occupy a middle ground on such issues: he does not rule out intervening in wild ecosystems in order, say, to reduce the disease burden. But he is also cautious: the impact of our actions will be hard to predict, and we might suffer from various cognitive biases in the way we evaluate their implications. Elsewhere, Sebo has suggested that both leaving animals in the wild and bringing them into captivity may end up harming them, and that a reasonable compromise might be to create and expand reserves and sanctuaries in which animals are largely, but not entirely, left to their own devices (Sebo, 2020). Given the epistemic, practical and motivational limitations we face, however, a priority should be to pursue infrastructural changes that can help at least some animals and humans now, while building knowledge and political will to enable more effective and ethical interventions in future.

Forests, meat, and the politics of energy

Mark Rowlands also wants us to think holistically and structurally about animals and their place in contemporary societies. In *World On Fire: Humans, Animals, and the Future of the Planet* he suggests that the first step is to understand the distinctive nature of the human civilisation that we have built, and its idiosyncratic methods of meeting its energy demands. All societies inevitably rely on some source(s) of energy, both for heating, transportation, and the like, and to power our own bodies. In the past, societies may have depended on gathering wood to build fires, while hunting wild animals for food, for example. Contemporary civilisations, by contrast, for the

most part burn fossil fuels to provide heat and sustain industry and transportation, while captive-breeding and then killing animals on an industrial scale to provide food energy (Rowlands 2021: 8). The trouble is, we are now coming to recognise that these choices have momentous consequences for the planet's ecosystems. Industrial agriculture, in particular, has led to what Rowlands calls a gigantic "biomass reallocation program," in which wild animal biomass is replaced by the domesticated species we prefer to eat (p.2). Like the burning of fossil fuels, industrial agriculture has been very bad for the climate (in part, because it has demanded extensive deforestation). As Sebo notes in his book, it has simultaneously driven mass extinction while making zoonotic pandemics much more likely.

This might lead us to question how much longer a civilisation organised along these lines can be sustained. Even putting climate change to one side, Rowlands suggests that the energetic basis of our civilisation has been rapidly eroding before our eyes: the average amount of energy expended to extract fossil fuels has climbed steadily, undercutting its ability to sustain the remarkable levels of economic growth we have become used to. But putting pandemics and climate change centre-stage, it is blindingly obvious that we need an exit route from our dependence on both fossil fuels and meat for energy. The nub of Rowlands' argument is somewhat technical, and revolves around the concept of energy return on investment (EROI). This ratio represents the amount of energy you get out of a process, divided by the energy you must put in to make it work. At the outset of the industrial revolution, it turned out that coal had an EROI vastly superior to anything humanity had found before; its extraction came to sustain a complex industrial society. Oil would go on to perform even better, with an EROI of anything between 30 and 100:1, underpinning what was (judged by the long historical sweep) a vastly luxurious civilisation. Its EROI has now declined, to about 25–29:1 today, since capitalism has burned up most easy-to-access sources of oil (p.100). But that ratio still supports affluent lives (for many, if not for all). On Rowlands' calculations, an EROI in the region of 12–14:1 will support our continued existence (p.75), while 25:1 or more will allow for at least modest comfort.

Even if fossil fuels were not producing climate change, we would soon need to seek alternatives. In one sense, all of this makes the green energy transition rather simple. Renewable energy sources need to be scaled up rapidly, and they need to demonstrate an EROI in the region of 25:1 or better (or 12–14:1, for a more spartan civilisation). The problem, Rowlands claims, is that this is much trickier than is widely recognised. Corn ethanol has an EROI of between 1 and 3:1, making it an irrelevance when it comes to rescuing civilisation (p. 100). Solar, with an EROI between 1 and 10:1, can make a contribution to our survival but it is not clear it can sustain the kind of civilisation we are used to. Wave power (at 15:1) and wind power (somewhere between 3:1 and 18:1) perform only a little better (p.101), as does nuclear energy. The efficiency of these technologies will no doubt improve over time; but it is far from clear that they are ready to rescue civilisation as we know it any time soon.

In that light, Rowlands argues that something else needs to change, and fast. A crucial step is to simplify our energy supply chains, by removing unnecessary or wasteful elements. In the case of food, that means removing meat from our diets. Food, after all, has its own EROI, and in the case of meat, it is a vastly inefficient one. Growing

plants and feeding them to livestock is a monumental waste of scarce energy. Cattle, for example, need to eat between 6 and 30 times as many calories as they 'produce' (p.124). Eating plants instead cuts out a very wasteful middleman. Moreover, if we ended animal agriculture, we could reforest much of the land. With an end to industrial agriculture, and afforestation of much of the land this frees up, the US (which Rowlands describes as the most energy-intensive society ever) would already be roughly 80% of the way towards carbon neutrality (p. 144). Ending animal agriculture would make a quick and massive contribution to reducing greenhouse gas emissions, including especially methane; the rest of the contribution would come from increasing forest carbon sinks. In making such changes, our societies would give nascent renewables time to improve their efficiency. As Rowlands puts it, by taking livestock-related methane out of the equation and removing the "upside-down EROIs of animal flesh and products, we would give nascent renewable technologies the breaking space they need to – hopefully – move a few steps away from the edge of the net energy cliff" (p. 128).

Rowlands's arguments hinge on some quite detailed empirical claims, which it is not easy for a political theorist to evaluate. What is striking about the argument as a whole is how holistic and systemic it is – perhaps an example of the kind of thinking Sebo calls for in his book. His arguments are creative and engaging – at times quirky - and his conclusions undoubtedly arresting. Simply put, his claim is that we now face a choice between meat and civilisation. As that suggests, much of the argument is instrumental in tone: if we want to tackle the climate crisis, and avoid still more zoonotic pandemics, we will have to end factory farming. He does suggest, however, that the case is over-determined. Though his main argument does not lean on it, he appears to believe we do wrong not only by harming individual animals, but also by whittling down the numbers of particular species – this represents an assault, Rowlands claims, on the "being" of a species (p.171). That was an argument that needed further development, and which seems to put him at odds with both Nussbaum and Sebo; but the wider argument for afforestation and an end to factory farming does not appear to depend upon it.

Conclusion

Considered alongside one another, the three books offer highly contrasting styles, but also a great deal of food for thought, which will hopefully encourage still more political theorists to give non-human animals a significant place in their work. They represent essential reading for anyone interested in relations between humans and other animals, and the future of the planet more broadly. With their distinct styles and preoccupations, they will no doubt trigger considerable discussion of the place of animals in contemporary politics, and in political theory.

My hope is that they will also trigger a debate about what happens next, *if* we are persuaded that relations between humans and other animals stand in need of some kind of revolution. Sebo and Nussbaum say a good deal about the kinds of institutions, laws, or processes that might be required to ensure better protections of animals' interests (Rowlands rather less so – that is not his project). But the books have relatively little to say about the distributive politics this might involve. It seems obvious that protecting the interests of non-human animals is going

to generate lots of costs – even if it turns out to be net-beneficial for our species in the long term. If so, who ought to pick up the tab? Whose lifestyle choices or preferences ought to be first on the chopping block if we need to rein in the human impact on other animals? In the past, measures to protect individual animals from human predation – especially along the model of the Protected Area – have frequently involved exclusion and dispossession, and solidified power relations that are colonial or neo-colonial in character. There are, presumably, ways of protecting animals that do not intensify existing social injustices. But what do they look like? If the relationship between humans and other animals needs to be transformed, what exactly would a just transition look like? The books under review do not address those questions at any length. But they certainly prompt them, to my mind at least. The distributive politics of protecting non-human (and therefore human) life is a fertile area for future study.

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- 2. Important recent works include Donaldson and Kymlicka (2011) and Cochrane (2018).

References

Cochrane A (2018) Sentientist Politics: A Theory of Global Interspecies Justice. Oxford: Oxford University Press.

Donaldson S and Kymlicka W (2011) *Zoopolis: A Political Theory of Animal Rights*. Oxford: Oxford University Press.

Nussbaum M (2022) Justice for Animals: Our Collective Responsibility. London: Simon & Schuster

Rowlands M (2021) World on Fire: Humans, Animals, and the Future of the Planet. Oxford: Oxford University Press.

Sebo J (2020) All we owe to animals. Aeon, 15th January.

Sebo J (2022) Saving Animals, Saving Ourselves: Why Animals Matter for Pandemics, Climate Change, and Other Catastrophes. Oxford: Oxford University Press.

Sneddon L (2019) Evolution of nociception and pain: Evidence from fish models. *Philosophical Transactions of the Royal Society B* 374(1785): 20190290.