What if all animals are sentient?

Commentary on **Birch** on *Precautionary Principle*

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Abstract: Birch develops a useful framework for determining when the Animal Sentience Precautionary Principle (ASPP) should be invoked. He rightly notes that there is a lack of agreement among social scientists, ethicists, and legislators even about whether the precautionary principle is useful, let alone when and how it should be implemented. His proposal is to establish a kind of cognitive threshold, and only when an animal shows a sufficient level of sentience would the ASPP be appropriate. From the point of view of the Cellular Basis of Consciousness model (Reber, 2016), all animals are sentient. If correct, the problems Birch identifies need to be confronted from a different perspective.

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I commend Professor Birch (2017) for his careful overview of the ethical issues that emerge when animal rights legislation based on the *precautionary principle* is contemplated. He recommends a two-stage process. First, set the BAR — determine whether there is evidence that an animal is sentient and can experience phenomenal pain. When such evidence is presented, ACT to pass animal rights legislation regulating the treatment of all species in the order of which that animal is a member. It's difficult to object to Birch's framework and I don't. But, I have thoughts to share, things worth ruminating about.

Birch's main goal is to set a threshold for the application of the ASPP, find the point in the pantheon of life where there is enough evidence of sentience to arouse concern but not enough for scientific certainty. Difficulties, he notes, would arise if the threshold for sentience is set too low. There "cannot be a default presumption of sentience in all cases" — a position he regards as "extreme" while acknowledging, seemingly grudgingly, that it could be true.

As I first argued twenty years ago (Reber, 1997) and again more recently (Reber, 2016, 2017), there are good reasons for concluding that, in fact, all animals, including single-celled species, are sentient. This thesis, dubbed the Cellular Basis of Consciousness (CBC), is developed in detail in the forthcoming book, *Caterpillars, Karyotes, and Consciousness: An Essay on the Origins of Mind*. In it, an overview of the behaviors of unicellular species is presented showing that they experience pain, escape from aversive stimuli, and at least one unicellular eukaryote (*Stentor roeseli*) can learn to make anticipatory moves to avoid a noxious substance. Prokaryotes

determine the nutrient-level gradients of their environment, compare them with internal metabolic conditions, and make deliberative movements away from nutrient-poor areas and toward rich ones. They have memories lasting anywhere from a few seconds up to two hours. They also communicate with each other both as individuals and as members of a collective.

Birch lists three behaviors as symptomatic of sentience: (a) self-delivery of analgesics; (b) motivational trade-offs, weighing the avoidance of a noxious stimulus against other preferences; and (c) conditioned place avoidance. Unicellular species show the latter two and might also show the first. Two out of three suffice; Birch opines that even one should be sufficient.

If the CBC model is correct, and these interpretations of unicellular behaviors are accurate, and I believe they are, then Birch's BAR gets set in a manner that is going to make it difficult to develop a useful ACT. If every animal is sentient, experiences subjective pain, and behaves in ways that reflect such phenomenal states, then, perforce, all species come under the umbrella of the legislative reach of animal rights laws. Does such a conclusion undermine Birch's effort? No, but it does mean that pragmatic cost-benefit analyses (that he acknowledges are relevant) become paramount. If there is no demonstrable threshold for invoking the ASPP, then the determinations must be carried out using a different framework, one more focused on pragmatic and practical considerations.

Let's take a look at Birch's consideration of the "replacement" principle in scientific research where one looks for a species from a less-sentient order to replace the one in the standard protocol. This strategy, from the CBC perspective, touches on a key issue. There are circumstances where it is considered appropriate to subject some animals to aversive, experimental treatment, for example, if it is highly likely that the procedure would result in significant advances in human health. The replacement procedure says look for the least sentient animal that will provide useful data. But what if the study improved the lives, not of *H. sapiens*, but of non-human primates? Or of dogs, cats or cephalopods or crustaceans? In these cases, would the order or species used in the study be a relevant consideration? Would it be just to subject a particular species to pain if the outcome is likely to have value to another, more sentient species?

Animal rights regulations based on this principle would call for us to, somehow, grade the valence or degree of sentience of the target species. How would we do this? By how many neurons the species has? Or if not neurons, then what? By Giulio Tononi's information metric Φ which is based on the number of interacting elements in a system (see Tononi et al., 2016)? Birch appreciates what a hornet's nest this is:

> "... it seems reasonable that a greater degree of sentience should imply a greater degree of regulatory oversight, although (as noted above) this raises the question of how degrees of sentience are to be conceptualized and estimated (if such comparisons are even possible). I cannot do justice to this complex and difficult issue here."

Because sentience, according to CBC, is as universal in the animal kingdom,[1] it raises yet another question. Do animals that are dangerous or have no discernible value to human existence, or the planet's ecology, have rights? In the CBC model, mosquitoes are sentient and feel pain. They are used in a number of areas in biomedical research. Do we care about protecting them? Should we? Mosquitoes are the only species to have caused more human deaths than humans. How about species that threaten the existence of other species? Mites have been implicated in the world-wide epidemic of bee-colony collapse. Can we use mites in painful procedures if it helps save bees? What if mites turn out to be more sentient than bees.

Then there are those sentient bacteria. Some *probiotic* species, like *Lactobacillus acidophilus,* promote health; others like *Mycobacterium tuberculosis* are deadly; and still others like *Escherichia coli* have strains, some beneficial, others decidedly not. Should only some come under animal protection legislation when presumably all share equivalent mental states?

We routinely tolerate the imposition of pain when a goal deemed worthwhile is involved. A trivial but effective example is recreational fishing. A worm impaled on a fish hook is clearly not having the best of days but we thread the steel through its body because it's an effective way to attract fish. The caught fish, with its mouth torn by the hook is in pain and dies by drowning in the bottom of our boat. We countenance such acts because the fish became our dinner or was mounted over a fireplace or won a prize in a contest. Even catch-and-release sport fishers have caused considerable suffering. In these cases, we typically do not impose animal rights legislation or, if we do, it is balanced and pragmatic.

Birch ponders the question of whether bony fish fall under the sentience umbrella. There is a long thread in this journal initiated by biologist Brian Key who argued (see Key, 2016), unpersuasively in my mind, that fish do not feel pain and, hence according to Ng (2016), do not have "welfare." Birch notes that were it determined that fish do indeed pass his BAR and should be covered by animal rights legislation, as many as *three trillion* fish a year would come within the scope of such regulations. He then steps quickly away from the issue. Fish feel pain but it's far from obvious how to do anything to lessen it within the fishing industry — not to mention the long-term implications for the diets (and lives) of billions of people, other animals, and the many secondary industries.

Birch's principles are a solid beginning and lend themselves to the pragmatic stance that will ultimately determine where, when, and how they are applied and when the precautionary principle is invoked. From the perspective of the CBC, every animal species is sentient so BAR is always in play and, by extension, so is ACT. Imposing the ASPP and crafting animal rights legislation thus have to be balanced, pragmatic, and adjusted by the cost/benefit assessment and the long-term value to society of any imposed regulatory systems and whether those values counterbalance any unpleasantness that might be left after enactment.

[1]The plant kingdom is excluded. The argument here is long and technical. It is pursued in the forthcoming book.

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