The question of whether invertebrates are sentient (meaning that they have the capacity for pleasure and pain) is contentious. Probabilistic moral reasoning, however, means that we can factor in the possibility of invertebrate sentience without having a firm answer as to whether it exists. This possibility may be sufficient to have a serious bearing on a number of human practices. We will argue that probabilistic moral reasoning makes invertebrate sentience a highly important consideration, on the basis that even if the probability that invertebrates are sentient is low, their large numbers render their potential suffering very weighty. Following this, the paper will outline some possible policy changes regarding insecticide use. These changes may go some way towards humans’ discharging their moral obligations towards invertebrates.

There are various ways to reason probabilistically about what we ought to do. For simplicity’s sake, we will stick to what is possibly the most straightforward method of probabilistic reasoning in ethics – Bentham’s “expected utility” formula. This formula combines the two basic ingredients of probabilistic moral reasoning – the probability of each possible outcome’s occurring, and the value of those outcomes.

I’m going to explain how a basic Benthamic expected utility formula works for those who might be unfamiliar with this kind of reasoning. It works by multiplying the value and probability of each possible outcome. Imagine you are on a game show, and you are offered a choice between two boxes. The host tells you that if you choose box A, you have a 50% chance of winning $100 (and a 50% chance of winning nothing). If you choose box B, you have a 90% chance of winning $50. Which would/should you choose?

The expected utility of choosing box A is 0.5 x 100 = $50. The expected utility of choosing box B is 0.9 x 50 = $45. The best option is therefore box A, as it has the highest expected utility. This kind of reasoning is a fairly intuitive way of coming to conclusions about the value of different options, and ultimately reaching a conclusion about which action to take (in this case the best action is “choose box A!”).

Pragmatically, using a formula like this may involve a pre-screening process in which obviously low-expected-utility outcomes are ignored. If there are several other boxes, each with a 1% chance of winning less than a tenner, I might not bother calculating all of those. However, if there is a box Z with a less than 1% chance of winning $100,000, this might be worth looking into. The expected utility of this is, after all, $1,000.

The value needn’t be monetary. We do not wish to enter into discussion here about how exactly value is to be conceived – it is sufficient for the argument that we are advancing here that sentience is valuable to some extent – that is to say that pleasurable experiences are good and worth pursuing (for oneself and for others – I trust and hope that there are no egoists in the room who think that only they themselves matter), and unpleasant experiences are bad and worth avoiding/reducing. Other commonly-possited valuable things, such as the satisfaction of desires, or

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1 Wigglesworth, V.B. 1980. ‘Do Insects Feel Pain?’ in Antenna, 4, pp.8-9
5 Lockwood, J. 1988. ‘Not to Harm A Fly: Our Ethical Obligations to Insects’, in Between the Species, 4(3) [online]
9 Elwood, R.W. 2011. ‘Pain and Suffering in Invertebrates?’, in ILAR Journal, 52(2), pp. 175-84
10 Magee, B., and Elwood, R.W. 2012. ‘Shock avoidance by discrimination learning in the shore crab (Carcinus maenas) is consistent with a key criterion for pain’, in The Journal of Experimental Biology, 216, pp.353-8
simply the preservation of life, may yield slightly different answers to the specifics of how we should deal with invertebrate suffering. However, I think that most plausible value theories, except for (illegitimate and untenable) anthropocentric ones that exclude the interests, or well-being, or desires (perhaps collectively: the value(s)) of non-humans entirely, will yield the same broad, overall conclusion: there is a weighty moral imperative on humans to reduce (their contribution to) invertebrate suffering.

As well as issues needing ironing out regarding value theory, it’s also not as easy to establish the probability of invertebrate sentience as in the example above, as we don’t have a helpful game show host to tell us the exact probability of each outcome. Burning a handful of ants under a magnifying glass might cause x amount of suffering, or it might cause y amount of suffering – it’s hard to know.

However, even if we think that the probability of invertebrates being able to suffer is quite low, the sheer number of invertebrates means that their suffering would be very weighty. Importantly, the number of invertebrates that exists might be irrelevant if we cannot do anything about most of them – the discovery of an invertebrate planet beyond our reach with lots of suffering creatures would have no bearing on our obligations to invertebrates here on Earth. However, invertebrate populations are relatively dense, with the effect that our actions will tend to affect invertebrates in far greater numbers than they will other kinds of animal. Numbers, therefore, dominate, making this like the example of the small chance of winning $100,000 above (box Z).

So now that you are all convinced that invertebrate suffering matters, let us consider which actions are available to us in terms of doing something about it. A lower-impact activity might be “pest” control in the home—some ways of removing invertebrates from your home may cause more suffering than others.

A larger-scale issue, however, is the control of invertebrates in agriculture. Insecticides kill enormous numbers of invertebrates, but so far discussion on this tends to focus on the instrumental effects of killing invertebrates (bees are a popular and important example) rather than the interests of the invertebrates themselves. Lockwood adumbrates a rudimentary schema for how different types of invertebrates control may cause different degrees of suffering. These range from measures that displace invertebrates without killing them (“cultural control”) to those that kill invertebrates, the most painful being those that involve slow deaths, like the use of pathogens and parasites.

Again, one is not required to commit to the idea that invertebrates can suffer – only that there is a sufficiently large possibility that their welfare weighs on our actions. This suggests that we should consider the welfare of potentially sentient invertebrates when considering policy regarding the use of insecticides.

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11 I think that the obligation would exist even in a world where humans were responsible for none of this suffering themselves. For the purposes of this paper, however, I will stick with negative responsibilities arising from the suffering that is caused to invertebrates by human activity.


13 It might also be worth noting that insecticides may be a net good – it’s possible that insect lives contain more suffering on balance than they do pleasure, such that killing them may be of benefit. This is a controversial idea that may lead to some counter-intuitive conclusions in other areas.