

Chapter 9 – On pain and suffering

People will not keep always in mind that pain exists in the world for a purpose, and a most beneficent purpose – that of aiding in the preservation of a sufficiency of the higher and more perfectly organised forms, till they have reproduced their kind.

Alfred Russel Wallace¹

In the Introduction I quoted Robert J Russell, presenting in relatively mild terms compared to many, the “hard truths” about natural evil that demand not only our explanation, but a setting to rights by God if he is to be considered good. He closed the paragraph by saying “*most animals are fated to an agonising death.*”² It’s the factual basis of that sentence, so representative of modern assumptions, that I want to question in this chapter, taking a number of approaches.

The baseline – human pain

It is the experience, personal or vicarious, of human suffering that generates concerns over the sufferings perceived to exist in nature as “evil”. We all ought to be aware of the truth that pain is necessary to our survival, as Wallace’s quote at the head of the chapter makes clear. Those with diminished pain sensation, such as leprosy patients, suffer progressive tissue damage as a result of repeated injuries. But we’re also aware of a direct link between pain and human sin, in that the most severe forms of pain are those deliberately designed as such by humans to damage or control other humans.

In fact, though, human pain is the only form about which we can be truly certain, since pain is an irreducibly subjective experience. I, like everyone else, know what it has been like to experience various degrees and types of pain only in my own life, and will return to that shortly.

My knowledge of pain in other people is founded on the same *theory of mind* that makes me able to differentiate myself *as* a self. In infancy, we human beings uniquely begin to be able to relate to other humans as beings like ourselves, making empathy and true communication possible. In turn, that ability to see others as “selves” makes it possible for us to see *ourselves* as if we were an “other”: I am not only “me” but “a person like you”. There is no good evidence that any other creatures gain this “theory of mind.”

When our sense of self is compromised, our experience of pain may be profoundly altered. A passage in Dickens strikes me, as a doctor, as being almost certainly drawn from real life, however paradoxical. In *Hard Times* Mrs Gradgrind, fading fast on her deathbed, is addressed by her daughter Louisa:

“Are you in pain, dear mother?”

¹ Wallace, Alfred Russel, *The World of Life* (London, Chapman and Hall, 1910) p.375.

² Russell, Robert J, *Cosmology from Alpha to Omega* (Minneapolis, Fortress, 2008) p.249.

*"I think there's a pain somewhere in the room," said Mrs. Gradgrind, 'but I couldn't positively say that I have got it."*³

But because, in normal circumstances, my sense of self is strong I can believe in your pain, inasmuch as I can compare it to mine when I suffered the same cause (an ear infection or a bruised elbow, perhaps), acted in the same way (moaning or wincing) and described the pain similarly ("I've got a dreadful earache!"). I can only gauge a pain worse than I've actually experienced (such as childbirth, being shot or being burned alive) by using my imagination and interpreting evidence indirectly. If somebody yells louder than I remember doing, their pain is presumably worse. If constipation was painful, what must delivering a baby be like?

Yet the subjectivity of pain can play us false, and we can take for granted neither that our own pain is a reliable indicator of harm, or that other people experience pain the same as we do.

In my professional career I specialised in back pain, and for two years ran a district NHS back pain clinic. This led to some interesting observations. The first and most profound, and yet commonplace, is the effect of mental state on pain. A depressed patient will generally feel any pain more severely, as will someone who believes the pain has a serious cause. Conversely, adrenaline surges can virtually obviate pain, an acute stress situation often rendering even severe injuries unnoticeable. My professional friends in the hospice movement tell me the difference peace of mind makes to pain (when it occurs – often it doesn't) in terminal disease.

Severe injury also boosts endorphin production, markedly reducing pain: the more devastating the trauma, the less suffering is often involved. The deep shock (that is, loss of effective blood circulation) of major injury also has the effect of an anaesthetic. Other physical states can alter pain too – commonly back pain will get worse in those suffering an intercurrent viral infection. All these things should not surprise us for pain, as I said, is irreducibly subjective.

Chronic (or "central") pain is a very intriguing issue, because in general it is not the result of continuing tissue damage (previously regarded definitionally as the cause of pain), but of autonomous pain pathways set up in the central nervous system, often after an initial injury has completely healed. Part of the treatment is to educate the patient that they are *not* harming themselves by, say, exercising a painful back.

This is one reason I am annoyed by evolutionary biologists claiming how unusually prone to injury the human spine is because of our unnatural upright gait: in fact most acute back injury comes from doing unnatural things like heavy lifting when one has already spent too much time in unnatural sedentary occupations, rather than in the upright exercise to which we are best suited by nature.

Chronic back pain occurs most often when inadequate rehabilitative exercise is done after acute injuries. It has nothing to do with mechanical failure, but (one is tempted to say) over-engineered neurological software. Central nervous software, as we are now discovering, is often reprogrammed by the higher brain centres – leading us back to the profound influence of psychology on pain perception.

³ Dickens, Charles, *Hard Times*, ch.IX.

Pain is also affected by such non-physical things as culture – in hospital medicine one had to be aware that certain social groups and nationalities were unusually sensitive to quite minor sources of pain. Failure to take it into account could even lead to unnecessary acute surgery. Conversely, Alfred Russel Wallace, who had extensive experience of dwelling with hunter-gatherer tribes, reported that:

*...we have the well-known facts of the natives of many parts of the world enduring what to us would be dreadful torments without exhibiting any sign of pain.*⁴

Neither is difference in pain perception purely psychological. The so-called *fibromyalgia* is a condition involving generalised pains, widely believed to have a large psychological component. Be that as it may, neurological studies reveal spinal cord and brain abnormalities which show that such patients process pain quite differently from non-sufferers.⁵

So the subjectivity even of the common experience of human pain confirms Wallace's warning that:

*Our whole tendency to transfer our sensations of pain to all other animals is grossly misleading.*⁶

He points out specific factors in the evolution of man that make increased pain sensitivity a likely adaptation. Not only do we have an unprotected skin prone to injury, and a lengthy period of infancy and childhood when avoidance behaviours are not in place, but we have created for ourselves unusual dangers against which pain must warn us. These include first the use of fire, then increasingly hard and sharp tools and weapons, and ultimately the complex and dangerous machinery that now forms the environment of "a large proportion of the human race". As he goes on to conclude:

*... it is this specially developed sensibility that we, most illogically, transfer to the animal-world in our wholly exaggerated and often quite mistaken views as to the cruelty of nature!*⁷

I will return both to Wallace's evolutionary viewpoint and the question of how we *may* try to gauge suffering in nature later, but first I will reinforce his warnings on the irreducible subjectivity of pain *vis a vis* the animals, by citing a modern author. Whilst we may legitimately employ our "theory of mind" to understand pain in fellow-humans, we are completely unwarranted in doing the same for any other species.

Philosopher Thomas Nagel wrote a seminal paper on the "mind-body" problem, in order to show that it is quite impossible to describe subjective experience objectively (hence drawing attention to the weakness of reductive materialism). He called it *What it is like to be a bat?* He chose a bat as his example because, although a relatively advanced mammal, its lifestyle – flying and hunting by echolocation – is completely alien to us. Yet there is "something that it is like" to be a bat.

⁴ Wallace, *op. cit.*, p.379.

⁵ Clauw D J, Arnold L M, McCarberg B H, *The Science of Fibromyalgia (Mayo Clinic Proceedings, 2011 [86]) pp.907-911.*

⁶ Wallace, *op. cit.*, p.377.

⁷ *Ibid.*, p.379.

It will not help to try to imagine that one has webbing on one's arms, which enables one to fly around at dusk and dawn catching insects in one's mouth; that one has very poor vision, and perceives the surrounding world by a system of reflected high-frequency sound signals; and that one spends the day hanging upside down by one's feet in an attic. In so far as I can imagine this (which is not very far), it tells me only what it would be like for me to behave as a bat behaves. But that is not the question. I want to know what it is like for a bat to be a bat. Yet if I try to imagine this, I am restricted to the resources of my own mind, and those resources are inadequate to the task. I cannot perform it either by imagining additions to my present experience, or by imagining segments gradually subtracted from it, or by imagining some combination of additions, subtractions, and modifications.⁸

In the same way, we must conclude that it is entirely invalid to project *our* ideas of what it might be like for the bat to be caught on the wing by an owl. We can only vaguely conjecture (recognising it is little more than an exercise of fantasy) on the basis of what scientific information we have.

But before leaving the human sphere, I want to repeat a version of “Torley’s window test” (see Chapter 7), to question to what extent pain, even in our human experience, is truly an “evil”. There are certainly those whose entire life has been blighted by previous pain (one thinks of torture victims) or other sufferings like the trauma of war, of violent crime, of road accidents or chronic illness. But for most of us, even quite severe episodes of pain are seen, in retrospect, as part of life. At the least they can make us more appreciative of the more prevalent good times, and (despite some philosophers’ claims to the contrary) quite often can be viewed as enriching our life-experience in numerous ways.

Personally I have (so far) been pretty fortunate in health matters. But apart from the common illnesses I have suffered very painful back injury (ironic, but also valuable, for a back pain practitioner). I have also suffered from periods of depression which, although not anything like as severe as those I have treated in others, are not something I would choose to repeat. Most people I know have comparable experiences – the painful childbirth, the acute appendicitis, the crushing coronary artery thrombosis, and so on. But in a majority of cases when those episodes have passed away they seem, in retrospect, transient and even ephemeral. I have no urge whatsoever to come before God’s throne and demand redress for my past sufferings, even had I done nothing in my life to deserve such troubles... and we must not forget that this book is written on the assumption that mankind lives in painful exile from God because of sin.

I may (and indeed should) look at the severe sufferings of others and ask “Why?” – but if I am honest I see no need to add my own quite minor, and even in some ways life-enhancing, trials to the weight of evils requiring explanation. They make perfect sense in a good world which, as yet, remains subject to mortality. This must surely relativize, to a significant extent, the “problem of natural evil” applied to human suffering.

I have a feeling that much animal suffering ought to be seen in the same way.

⁸ Nagel, Thomas, *What is it like to be a bat?* in *The Philosophical Review* LXXXIII 4 (October 1974) pp.435-50.

The evolution of pain

In the chapter on the supposed cruelty of nature in Wallace's *World of Life*, perhaps his most original contribution is in treating pain as, itself, an evolutionary phenomenon. In passing, let me mention that he quotes Charles Darwin, whose repulsion against insect parasitism in a letter to Asa Gray is oft-quoted, but whose more considered statement on natural evil in *The Origin of Species* isn't:

When we reflect on this struggle, we may console ourselves with the full belief, that the war of nature is not incessant, that no fear is felt, that death is generally prompt, and that the vigorous, the healthy, and the happy survive and multiply.⁹

If one remembers that Darwin, like Wallace, was essentially a field naturalist, one begins to sense that such testimony is far more valuable than that of desk-bound academics engaged in theodicy or anti-theodicy.

Wallace's evolutionary argument is, as is natural given that he originated the theory, mainstream adaptationist Darwinism. No trait in evolution occurs except because of its utility, and therefore pain has evolved as far as, and no further than, it is useful to the survival of organisms. One may add from more recent knowledge that adaptations also pose a cost to the animal in terms of energy. Not only, then, would excessive pain detract from survival directly, but through the energy cost of developing and carrying around neurological mechanisms that aren't beneficial.

As for the earliest, primitive, forms of life Wallace reasons that it is certain they evolved the minimum sensation necessary for the purpose of their short existence, and that *"anything approaching what we term 'pain' was unknown to them."*¹⁰

These organisms, being neither able (nor intended by the Creator) to avoid being ingested by higher forms, would have no reason whatsoever to benefit from pain sensation, and therefore do not possess it. But the same goes even for higher forms that form the basis of food chains:

...it is almost as certain as anything not personally known can be, that all animals which breed very rapidly, which exist in vast numbers, and which are necessarily kept down to their average population by the agency of those that feed upon them, have little sensitiveness, perhaps only a slight discomfort under the most severe injuries, and that they probably suffer nothing at all when being devoured. For why should they? They exist to be devoured; their enormous powers of increase are for this end; they are subject to no dangerous bodily injury until the time comes for them to be devoured, and therefore they need no guarding against it through the agency of pain.¹¹

Note that this is not a philosophical argument, nor one based on anatomical or physiological data open to different interpretations, but is a prediction from the logic of the very evolutionary theory that is held up (purely on the basis of the metaphor of the "struggle for existence" over deep time) as evidence for ubiquitous suffering.

In Wallace's opinion, this argument places within the realm of "painless animals"

⁹ Darwin Charles, *Origin of Species* (1859) ch.3., in Wallace, *op. cit.*, p.370.

¹⁰ *Ibid.*, p.375.

¹¹ *Ibid.*

*...almost all aquatic animals up to fishes, all the vast hordes of insects, probably all Mollusca and worms; thus reducing the sphere of pain to a minimum, throughout all the earlier geological ages, and very largely even now.*¹²

Amongst the higher animals, he points out by the same evolutionary argument that small birds and mammals are generally less subject to injuries from falls or fighting than us, and so pain is likely to be much less developed in them. This leaves only the larger and heavier animals likely to benefit from (and therefore to suffer because of) well-developed pain sensation.

R J Russell's previously cited book quotes a particularly juicy piece of "creation as nightmare" prose from a Pulitzer Prize winning book called *The Denial of Death*:

*What are we to make of a creation in which the routine activity is for organisms to be tearing others apart with teeth of all types – biting, grinding flesh, plant stalks, bones between molars, pushing the pulp greedily down the gullet with delight, incorporating its essence into one's own organisation, and then excreting with foul stench and gases the residue.*¹³

Such colourful rhetoric (involving as it does, mainly the denial of life rather than death) becomes rather tedious (I could add many similar passages from J S Mill to Ken Miller). But, to quote another American writer from the same era, "*After a while your cheap talk don't even cause me pain.*"¹⁴ Wallace, once more, takes a much rarer *scientific* attitude to teeth and claws: he reasons that they have evolved to catch and kill prey as quickly and efficiently as possible. The escape of a severely wounded quarry helps neither party. Neither, in fact, does the predator benefit from prolonged struggle, nor from drawing attention to the kill. The actual situation with regard to large hunters, he says, is that:

*[t]he suddenness and violence of the seizure, the blow of the paw, the simultaneous deep wounds by teeth and claws, either cause death at once, or so paralyse the nervous system that no pain is felt till death very rapidly follows.*¹⁵

Against the previously cited statement, *via* Karl Giberson, that the domestic cat which teases mice cannot be a creation of God, Wallace points out that, in the wild, carnivores

*...hunt to kill and satisfy hunger, not for amusement; and all conclusions derived from the house-fed cat and mouse are fallacious.*¹⁶

And so Wallace, possibly the nineteenth century's greatest field biologist, shows *from* evolution that evolution has no propensity for producing a particularly cruel nature. His conclusions are largely borne out by the study of the anatomy and physiology of animal pain.

The biology of pain

The higher animals undoubtedly feel pain. But those who work with them, such as farmers, tend to believe animals feel pain somewhat differently than do humans. That much is obvious even to pet

¹² *Ibid.*

¹³ Russell, *op. cit.*, p.235, quoting Becker, Ernest, *The Denial of Death* (New York, Free Press, 1973), p.282-283.

¹⁴ Jimi Hendrix, *Machine Gun* (from *Band of Gypsies*, 1970).

¹⁵ Wallace, *op. cit.*, p.377.

¹⁶ *Ibid.*

owners. Accidentally tread on your dog's leg and she'll yelp, lick it and carry on trotting on it, even when there is clearly ongoing injury. Tread on your child's leg and she'll grizzle until tempted to forget it by cuddles or treats. Tread on an adult's leg and the chances are he'll bear a grudge and get back at you somehow later on. To an extent these differences are reflected in physiology and anatomy.

Whatever philosophical views one takes on the actual perception of pain, the simple fact is that it can only exist at all in the presence of a suitable nervous system to mediate it, and some centre of nervous activity to receive and process signals from damaged tissue. This immediately excludes the vast majority of the world's living organisms from the very possibility of pain or suffering.

The *Monera* (including bacteria), *Protista* (including the diatoms and dinoflagellates that alone make up 75% of the world's biomass and all the Protozoa), *Fungi* and *Plantae* all lack a nervous system and so cannot possibly suffer pain in any unpleasant subjective sense¹⁷. And yet the danger of anthropomorphism is shown by the fact that protozoa, and even unicellular prokaryocytes like bacteria, exhibit irritability to harmful stimuli, and even plants avoid noxious agents by differential growth. But if that is evidence of suffering, one must say the same of the noise my car sensors make if I try to reverse into a wall. Our own cells exhibit such irritability responses inside us, and yet even the sum of trillions of them gives us no sense of suffering – unless those cells happen to be the right kind of pain neurones.

90% of the remaining types of organism are *invertebrates*, from sponges through to insects. The last group forms a large majority of all animal species. In the simpler types of invertebrate, such as the *Coelenterata* (jellyfish) there is, at most, a diffuse nerve network to coordinate activity. In most of the more complex invertebrate types, the neurological organisation is segmental, and this is highly significant for pain sensation.

Briefly, a segmental nervous system spreads the function of coordinating responses to somewhat independent ganglia in each segment of the creature's body, with the brain being relatively insignificant. In human medicine, one effective method of anaesthesia is regional nerve blockade, of various types, and this in effect imitates a segmental nervous system specifically in order to abolish pain.

In my own minor surgical work as a general practitioner, that meant a "ring block" of the digital nerves of a finger or toe, using lignocaine. But pain consultants could effectively deal with back pain using caudal epidural injections, or intractable cancer pain using regional blocks of, for example, the brachial plexus. Epidural anaesthesia enabling completely painless childbirth is commonplace.

The point is that if a source of pain is isolated from a central organ capable of recognising "I am in pain" (our cerebral cortex, for example), there is no pain. And the higher invertebrates are all in that situation permanently by the nature of their neurological hardware.

As for their brains, pain processing just doesn't seem part of their remit. In the case of earthworms, for example, whose brains (as those of us who have dissected them can testify), is a pair of tiny supra-pharyngeal ganglia the size of pin-heads,

¹⁷ Much of the material for this and the next section is derived from a useful website by Glenn M. Miller <http://christianthinktank.com/predator.html> (accessed 06/01/2016).

*The brain appears to direct the movements of the body in response to sensations of light and touch. And it has important inhibitory functions, for if it is removed the worms move continuously, but otherwise their behavior is affected little.*¹⁸

Although the insect brain is somewhat larger and more advanced, it still seems largely concerned with coordinating and inhibiting body movements – the movements themselves are organised at segmental level, and an insect without a brain can still jump or fly, only less appropriately. The brain is responsible for more complex behaviours, and can modify them by learned responses. But

*The segmental ganglia are connected and coordinated by nerves that run in the cords, but each is an almost completely independent center in control of the movements of its respective segment (or segments) and appendages. In some insects these movements have been shown to continue in segments that have been severed from the rest of the body. An isolated thorax is capable of walking by itself, and an isolated abdominal segment performs breathing movements.*¹⁹

Some remarkable observations demonstrate more positively that many insects, which are among the most advanced invertebrates, do not experience pain at all:

*A dragonfly, for example, may eat much of its own abdomen if its tail end is brought into the mouthparts. Removal of part of the abdomen of a honeybee does not stop the animal's feeding. If the head of a blow-fly (Phormia) is cut off, it nevertheless stretches its tubular feeding organ (proboscis) and begins to suck if its chemoreceptors (labellae) are brought in touch with a sugar solution; the ingested solution simply flows out at the severed neck.*²⁰

Such (unkind) observations are relevant to Darwin's iconic example of the horrors of insect parasitism, and particularly those of the *Ichneumonid* wasps. Apart from the considerations already mentioned, insects have few *internal* nerve receptors in which pain could arise. Many parasitized insects carry on a normal life as the parasite develops, dying quickly only when the grown parasite bursts out. Some parasites paralyse their larval hosts with venom – which, of course, in a segmentally-organised organism is the equivalent of a general anaesthetic.

This kind of parasitism in which the parasite (or strictly, "parasitoid") develops within a single host, eventually killing it, is common in insects, involving around 10% of all insect species. But more commonly hosts are little, if at all, aware of their parasites and are not killed by them, nor hurt by them. In fact there is no clear demarcation line between parasitism, commensalism (in which the organism does no harm to its host) and symbiosis (in which host and symbiont benefit each other).

Of the invertebrates, the only other examples which might provoke difficult questions about suffering are the squids and octopi, widely regarded as intelligent and even (by some theistic evolutionists) considered an alternative candidate for the implanting of *imageo Dei* had God not chosen instead an intelligent ape²¹. But their brains are still fused ganglia rather than individually developed organs, which although enabling quite sophisticated coordinated responses appear not to

¹⁸ Buchsbaum R, Buchsbaum M, Pearse J, Pearse V, *Animals without Backbones* (Chicago, 1987 [3rd ed.]) p.300.

¹⁹ *Ibid.*, p.378.

²⁰ *Encyclopedia Britannica* "Sensory Reception: Mechanoreception"

²¹ I won't even begin to critique this understanding of what "creation" and "God's image" mean here.

allow the integration of internal sensory data – and “suffering” is necessarily just such an integrated response. In other words, their nervous system is specialised in remarkable ways, but not in ways comparable to the mental “unity” experienced by ourselves, and possibly the higher vertebrates, to which we now turn.

These “higher vertebrates” constitute only around 45,000 species, somewhat less than 5% of the animals, amongst anything up to 10 million living species in total; it is a much lower percentage in terms of numbers of individuals. Before we even look at pain amongst the vertebrates, the claim that “most animals suffer an agonising death” is already completely discredited.

The fish actually constitute several distinct taxa, and half the vertebrate species, but since the familiar *Teleostae* (such as cod or salmon) are the most developed neurologically, what is said about them should apply to the rest.

In fish the forebrain is far less developed than in other vertebrates. This, as in the invertebrates, is compensated by more autonomy at a segmental level, and the delegation of roles to highly specialised cells. This leads to a wide range of purely reflex functions. For example:

After the spinal cord of a fish has been cut, the front part of the animal may respond to gentle touch with lively movements, whereas the trunk, the part behind the incision, remains motionless. A light touch to the back part elicits slight movements of the body or fins behind the cut, but the head does not respond. A more intense ("painful") stimulus, however (for instance, pinching of the tail fin), makes the trunk perform "agonized" contortions, whereas the front part again remains calm. To attribute pain sensation to the "painfully" writhing (but neurally isolated) rear end of a fish would fly in the face of evidence that persons with similarly severed spinal cords report absolutely no feeling (pain, pressure, or whatever) below the point at which their cords were cut.²²

Fish do have mechanical, chemical and thermal receptors in their skin, but whereas in humans they are connected via pain fibres to the higher cortical centres, these centres are absent in fish. It is therefore likely that they are routed to more purely reflex behaviours, explaining the “agonised” response of the denervated tail of the fish.

It may be added that young fish – the majority of those becoming prey items – have an even less developed nervous system.

The remainder of the living vertebrate groups – the amphibians, reptiles, birds and mammals – become, as one would expect both on taxonomic and evolutionary grounds, progressively more like us in their neurological organisation. But in the reptiles, and even more so the amphibians, the cerebrum is smaller than those of mammals by orders of magnitude, the average reptile’s cerebral hemispheres being perhaps 5% of a typical mammal’s, as a proportion of body mass. If our brain is required for consciousness, including consciousness of pain, it is hard to attribute a high degree of consciousness to reptiles and amphibians.

²² *Encyclopedia Britannica, loc. cit.*

That leaves us with the birds and mammals, totalling around just 15,000 living species. Amongst the extinct species we should probably include the more advanced dinosaurs along with the birds, in view of what is now believed about their close relationship to them.

Although birds do not possess a developed neocortex like mammals, recent work suggests that a set of nuclei based on the dorsal ventricular ridge (DVR) serves the same function²³. Birds are warm-blooded, exhibit complex and sometimes intelligent behaviours and, most significantly, respond to painful stimuli with a set of stress responses, in the same way that mammals do.

Whilst it remains risky to attribute the same kind of awareness that mammals have to creatures with such a different neurological heritage, it seems reasonable to suggest that convergence to similar function would produce comparable levels of sensation. But we must still keep in mind that projecting our own experience even on to other mammals is unwarranted, as we have seen. A human being is, objectively speaking, a very unusual creature, even before we consider our particular position in God's Creation theologically.

But the numerical point remains – whether we include the birds, and maybe the dinosaurs, with the mammals, or whether we exclude them, we are left with only a tiny proportion (much less than 1%) of all living species that appear even theoretically capable of experiencing agony, or even significant suffering. And as relatively large animals, though their absolute number is large (perhaps 400bn. birds and 100bn. mammals) they still constitute a very small percentage of all organisms. It is interesting how closely this conclusion matches that of Alfred Russel Wallace, working on theoretical evolutionary principles, over a century ago.

Pain of death

What proportion of “sentient creatures” (if, for the sake of a label, we use that vague term for the birds and mammals which may be capable of significant pain) actually do die in circumstances that would lead to pain? Fewer than you'd think, both in numerical terms and in the degree of suffering.

One problem, which there is no space to explore much here, is our biased impression of “life in the wild” because of our reliance on TV documentaries. The tendency to get higher ratings for violence and other emotion-stirring is longstanding. It has led, and still leads, not only to misleading editing, but to staged kills, anthropomorphic scripts and musical manipulation of viewers' emotions. Dispassionate science doesn't sell films – even science documentary films. As one leading film producer notes:

Far too many producers have resorted to creating "nature porn" – productions focusing solely on the blood, guts and sex of the animal kingdom. Graphic footage of shark attacks and feeding frenzies might make for thrilling entertainment, but it is irresponsible. Programs like Untamed and Uncut and Man vs. Wild depict animals as menacing at a time when these

²³ Dugas-Ford J, Rowell J J, and Ragsdale C W, *Cell-type homologies and the origins of the neocortex* (PNAS 2012 109 (42) 16974-16979)

*animals face constant threat. By misleading audiences and inspiring fear and terror, these TV programs are effectively discouraging conservation.*²⁴

There may be a relatively small number of species theoretically capable of pain, but there are far fewer actually capable of *inflicting* it. For example, as a crude measure the number of species in the order *Carnivora* is just 270. It also has to be taken into account that, simply on thermodynamic grounds, a habitat can support vastly fewer carnivores than it can herbivores:

The total mass of the animals at the top of the food pyramid, the secondary carnivores, is less than the total mass of the animals close to the plant source of food, the herbivores, because there is less energy available to the secondary carnivores. An individual secondary carnivore is usually very large. Large body size is useful to these animals, since it enables them to capture and kill their prey. However, the number of such carnivores is small.

*All the insects in a woodlot weigh many times as much as all the birds; and all the songbirds, squirrels, and mice combined weight vastly more than all the foxes, hawks, and owls combined.*²⁵

Furthermore, most herbivores are not actually targeted by carnivores at all. To begin with, nearly all carnivores will scavenge whatever they find already dead from other causes, even if significantly decomposed. Even amongst lions 10-15% of the diet consists of what they have found dead, not killed.

But there is a general principle that herbivores holding a territory will be relatively immune to predation, whilst the killers target

*...the homeless, transients, the weaker animals forced out to live in sub-optimal habitats and on those suffering from disease or from wounds received in territorial fights with their fellows.*²⁶

This has been observed in the case of muskrats co-existing with foxes and mink in the USA, hyenas in Africa ignoring the local Thompson's gazelle, in whose territories they slept, to hunt elsewhere²⁷, and even in the case of my own local foxes trotting daily past my chicken run without attempting gallicide over the last six years.

*The natural predator is not a random killer, nor does he choose trophy specimens: his selection, based on what he can most easily get, is comparable with that of the stock breeder who eliminates weaklings from his breeding herd...*²⁸

Neither does it appear that potential prey animals live their lives in fear. When I suggested in an earlier chapter that you take a look at the nature outside your own door, I doubt that many were

²⁴ Palmer, Chris, *Into the Wild, Ethically: Nature Filmmakers Need a Code of Conduct* (<http://www.documentary.org/magazine/wild-ethically-nature-filmmakers-need-code-conduct>, accessed 06/01/2016).

²⁵ Colinvaux, Paul, *Why Big Fierce Animals are Rare – an Ecologist's Perspective* (Princeton, 1978), p.24.

²⁶ Ewer R F, *The Carnivores* (Cornell, 1973) p.149.

²⁷ Griffin, Donald R, *Animal Minds* (Chicago, 1992) p.59.

²⁸ Ewer, *loc. cit.*

watching lions or leopards in their natural habitat. But those who do so actually report the same general air of peace observed by those of us in less exotic locations:

When Thompson's gazelles detect a predator, they often do not flee but move closer. They appear to be much interested and to be inspecting the dangerous creature... When the predator moved, the herd followed it, evidently aware of the danger and ready to dash off at the first sign of an actual attack. The predators also seem to understand the situation and rarely attack a group of alert tommies. Predator monitoring by territorial males was especially evident. At the approach of a predator in daytime the females generally moved away, while the buck stayed in his territory and kept the predator under close watch. As it moved he usually followed at a safe distance until it reached the territorial boundary. Then one of the neighboring territorial males would take over the monitoring of the dangerous intruder. This sort of predator monitoring was so effective that predators captured only one of fifty territorial males that Walther studied intensively during a two-year period.²⁹

Stress is not, contrary to common report, the customary state of prey animals. What would be the evolutionary point of that anyway? Stress is tuned to evoke appropriate responses in times of crisis: only humans make it a way of life. The net result is that what ecologists observe (as opposed to what theologians or evolutionary biologists suppose) is that nature is not, after all, a chaos of suffering. Instead,

Peaceful coexistence, not struggle, is the rule in our Darwinian world. A perfectly fashioned individual of a Darwinian species is programmed for a specialized life to be spent for the most part safe from competition with neighbors of other kinds. Natural selection is harsh only to the deviant aggressor who seeks to poach on the niche of another. The peaceful coexistence between the species, which results from evolution by natural selection, has to be understood as an important fact in the workings of the great ecosystems around us...

... It thus seems very likely that the larger and fiercer predators are not nearly so important in regulating the numbers of animals in nature as common sense suggests. They are really to be looked upon as scavengers without the patience to wait for their meat to die. They cheat the bacteria who would have got the bodies otherwise.³⁰

Most animals, then, are *not* predated. But for those which are, as I have said, it is in the interests of predators that death comes swiftly and with minimum pain or struggle. Predators tend to have a limited range of killing methods. A powerful bite to the neck, severing the spinal cord, kills more or less instantly. Compression of the trachea causes suffocation in a few minutes, and unconsciousness long before. Wild dogs and hyenas, for larger prey, resort to sudden disembowelment which, though extremely distasteful to human observers, kills within a couple of minutes and probably induces shock-anaesthesia very rapidly indeed.

Some animals, notably snakes of course, kill by using venom which is usually an anaesthetic neurotoxin: prolonged and unpleasant effects in humans suffering snakebite largely result from our

²⁹ Griffin, *op.cit.*, p.57.

³⁰ Colinvaux, *op. cit.*, pp.149, 156.

being too large to be prey, and so we are inadequately “dosed” in what, for the snake, is an extreme defensive strategy.

Amongst these common methods, the most prolonged is asphyxiation, and as a matter of personal testimony I can actually vouch for its lack of “agonised suffering”. As a teenager at a youth camp I was involved in a play fight with a younger kid, who unwittingly and over-enthusiastically locked my neck in a scissor grip. Since I was equally unwitting I had no sense of anxiety until I began to realise not so much that I couldn't breathe, as that I no longer realised what was going on. A second or two later I was unconscious.

The kid in question not being a lion, he instantly let go, and I quickly recovered without ill effects, and having even benefited from a near-death experience which need not concern us here! My own apprehension, then, was that waking up to a grey Welsh evening was something of a let-down compared to being strangled, though I can't say a Thompson's gazelle would see things the same way. But had my young friend eaten me, I should have been none the wiser. Ironically he's now a professor of clinical epidemiology.

Metaphysical issues

Amongst the birds and mammals, which I have loosely termed “sentient”, we can measure great changes of brain structure over evolutionary history. An *Archaeopteryx* had much less mental equipment than a raven, and an early Jurassic shrew-like mammal vastly less than a border collie. Do those differences correspond to a difference in pain perception? Since we can know next to nothing about non-human perception, we can't say with certainty, though it would seem likely. Why else go to the problem of evolving a bigger central nervous system? But although intuitively “brain” and “pain” go together, the *metaphysical* questions of mind and consciousness are still very challenging.

There is still no clear consensus about what the link is between brain structure and function, and human consciousness, let alone the more opaque question of animal consciousness. Materialist explanations of the former tend not so much to shed light on the latter, as to try and explain it away. The reason for this uncertainty is more than hinted at in Thomas Nagel's previously mentioned paper, *What is it like to be a bat?* It is simply impossible to give an objective material account of an irreducibly subjective experience. Science has little, if anything, to say about consciousness.

The fact that this is the case leaves open the strong possibility that the mind is not a material entity at all – and that the human brain, though necessary, is not sufficient to explain our conscious experience, including the experience of pain. Whether one sees our experience as the result some kind of emergent phenomenon or as a true dualism, it still leaves the question of the difference between human and animal experience unsettled. Whether my brain is fundamentally different from an animal's through evolution, or whether I alone possess an eternal rational soul, I am still ignorant of what animals experience.

Philosophers sometimes use the *zombie* as a model for considering consciousness. A philosophical zombie is a creature in every way like a human being, only without a self. It could eat, work, walk, talk and display appropriate emotions just like you and me, and yet would feel nothing whatsoever because it wasn't an “I”.

Presumably the goal of some people involved in robotics is to produce a machine that is sufficiently like a human that, even if you are not fooled, you can suspend disbelief and treat it as a “thou” rather than an “it”. Given the exasperating nature of those robotic answering machines at utility companies, repeatedly asking you if they’ve guessed your meaning correctly, one may doubt that this is possible.

But we are inveterate anthropomorphs, readily treating teddy bears or even old cars as people, and cuddly animals even more so. We have already seen how easy it would be to misinterpret the writhing tail end of a spinally-transected fish as pain. What if animals were no more than insensate machines? Stress reactions would be no guide to their experience, for even a lifelike robot or zombie would require them in order to respond in an entirely appropriate way to circumstances, and yet would still be entirely unconscious.

At one time, not too long ago, such a view was the received scientific wisdom. The key philosophical father of the modern scientific age, René Descartes (1596-1650) reduced everything in the material world to matter in motion – except for the human mind, which he equated with an immaterial rational soul created directly by God – the original “ghost in the machine”. This new approach led directly to the “mind-body problem” that has caused endless philosophical disputes since.

But although Cartesian dualism is not that popular now in philosophy, the idea persists in, for example, the belief of many scientists that they can view material events as a rational outsider, rather than being inevitably a part of the observed system. The scientific ideal of objectivity – what Thomas Nagel calls “the view from nowhere” in an influential book of that name – is a product of the Cartesian idea of a rational soul ultimately free of time and space. This assumption becomes particularly amusing in those reductive materialists who seek to persuade us that the rational mind is an illusion, as if they themselves were an objective rational mind viewing from somewhere outside this nihilistic reality.

Dualism of this sort also persists in the still common popular, though thoroughly unbiblical, Christian concept of the “soul” as a kind of spiritual pilot sitting somewhere in the material body and pulling its levers, whilst waiting to escape to heaven.

One conclusion from this early-modern concept of a uniquely non-material human soul was that animals, not being rational, possess neither a soul nor a mind. They are, on this view, mere automata – like the modern robot or zombie. Although a purely metaphysical conclusion, this was sufficiently congruent with the atomistic science of Descartes’ time to persuade many scientists that animals were entirely expendable, and insensible. The *Stanford Encyclopedia of Philosophy* says:

Descartes himself practiced and advocated vivisection (Descartes, Letter to Plempius, Feb 15 1638), and wrote in correspondence that the mechanical understanding of animals absolved people of any guilt for killing and eating animals. Mechanists who followed him (eg Malebranche) used Descartes' denial of reason and a soul to animals as a rationale for their

*belief that animals were incapable of suffering or emotion, and did not deserve moral consideration — justifying vivisection and other brutal treatment.*³¹

One can see this attitude graphically represented in the 1832 painting by Emile-Edouard Mouchy, *A physiological demonstration with vivisection of a dog*, which shows a group of indifferent students casually observing the dismemberment of a clearly distraught, but tightly pinioned, dog. Little seems to be known of the artist, but that his artistic purpose is moral appears from the presence of another dog (and hence future victim) tied up and forced to watch, as well as from the general composition.

There are, of course, true sadists among us, but only strong philosophical beliefs can turn ordinary and well-meaning people like medical students into torturers of animals. As late as 1874, when the RSPCA brought a case against a Paris physician and several British doctors involved in such a demonstration, accusations of cruelty by other experienced medical people shocked by the scene were answered by the experimental physiologists: *“That dog is insensible; he is not suffering anything.”*

It is instructive that it was only “irrational” human compassion that eventually overcame the power of an “objectively rational” metaphysical scientific foundation that had persisted for two centuries. But my reason for mentioning this is to show how little science itself has to do with attitudes to animal pain: the metaphysical commitments underlying the science can lead to radically different interpretation of the observations. It is true that Darwin’s theory stresses the continuity between human and animal (Darwin himself was strongly against vivisection on compassionate moral grounds, as was Wallace). But a Cartesian could be quite comfortable with evolution up to the point of the super-addition of a soul (the “image of God” in some theistic evolutionary parlance), and so insist on discontinuity in the matter of animal sensation.

It is true that physiological measures of stress are similar in both humans and higher animals, but that tells us no more than we learn by watching an animal in pain – a Cartesian could happily argue that the key element – a mind to hurt – was missing, and that the physiology was that of an automaton.

The fact is that the horror now expressed by scientists and other academics at suffering in the natural world, with or without considering evolution, is principally due to a shift in metaphysical, ethical or even aesthetic *fashion* from that of Descartes. It is *metaphysical*, in that there is a current preference for seeing continuity between the beasts and ourselves because we are thought of as animals, rather than seeing discontinuity on the basis of our rationality as they did in the Enlightenment. It is *ethical*, in that suffering is now seen as an absolute, rather than a relative, evil, largely due to the relativising of a once absolute morality (remember those mediaeval thinkers who, for the most part, simply did not believe that any suffering was undeserved). And it is *aesthetic* because our postmodern age has elevated subjectivity into a primary virtue. Those who have the right to “self-identify” as a different gender or race certainly have the same right to identify animals as people if they so choose.

³¹ Allen, Colin and Trestman, Michael, *Animal Consciousness*, *The Stanford Encyclopedia of Philosophy* (Summer 2015 Edition), Edward N. Zalta (ed.), <http://plato.stanford.edu/archives/sum2015/entries/consciousness-animal/> (accessed 06/01/2016).

Before that shift such suffering would have been self-evidently absent from the world; after it, its agony is self-evidently all-pervasive. But surely our understanding of God's Creation should be based on something more solid than currently prevailing sentiment?

I suggest that a Christian ought to take a more dispassionate look at the evidence, informed by a specifically Christian world view in which both our continuity with animal nature, and our discontinuity, is fully understood. One should add that when asking if, and how, animals feel pain, we should also fully understand our lack of any real knowledge on anything that could even make sense of the question.

Various biblical texts enjoin kindness to the higher animals, which suggests that they have real experience of pleasure and pain. God cares for the sparrow, and provides food for the ravens and the young lions, presumably because their welfare matters. For the same reason (as I have explored in this chapter) gratuitous violence is *not* actually the *modus operandi* of the natural world.

And yet the Noahic covenant in Genesis 9 holds animals accountable for the blood of man, but not *vice versa*. Jesus sacrifices a herd of pigs by drowning in order to save one man from Satan's bondage. Animal life appears less important to God than human life, and this surely cannot be accounted for purely on the grounds of the intrinsic spiritual worth of the former, as if it were a matter of economics. Otherwise, torturing dogs to train doctors would have no moral dimension whatsoever. It is far more likely that, in absolute terms, animal suffering is significantly less severe than human suffering would lead us to believe. But that gives us no warrant to inflict it unnecessarily.

Even so, I hope I have shown that our profound ignorance of what it is like to be an animal makes it supremely arrogant to accuse God of creating a world of extreme cruelty. The evidence does not in any way support it, and as Christians we should surely default to the position that God knew what he was doing when he created the world and called it "very good".