

Science, Sensitivity and the Sociozoological Scale: Constituting and Complicating the Human-Animal Boundary at the 1875 Royal Commission on Vivisection and Beyond

Abstract

Arnold Arluke and Clinton Sanders (1996) have argued that human societies index both humans and animals as belonging to particular rungs of the social hierarchy. They term this multispecies ranking the “sociozoological scale”. This paper will investigate how claims at the 1875 Royal Commission on Vivisection about the sensitivity of particular species and breeds not only reflected assumptions about human social hierarchy but also blurred the boundaries between the human and the animal in the process. It will further be shown how these claims were informed by 18th and 19th century humanitarianism, classism, scientific racism and evolutionary theory, and how these influences combined in claims-making about the relative capacity of particular animals to sense pain and ethical duties towards them that followed from this sensitivity. Particular attention will be given to the opposing efforts of commissioners Thomas Henry Huxley and Richard Holt Hutton to demarcate human and animal sensitivity and exempt companion animals from vivisection respectively. The paper concludes by considering the sociozoological orders constituted by the 1876 Cruelty to Animals Act, particularly through its focus on calculating pain, and the legacy and limitations of this constitution.

Key words: Sensitivity; Sociozoological Scale; Sympathy; Civilisation; Vivisection.

Introduction

The Royal Commission on the Practice of Subjecting Live Animals to Experiments for Scientific Purposes of 1875, otherwise more commonly known as the First Royal Commission on Vivisection, was a pivotal event in the history of laboratory animal welfare. Its recommendations for a system of licensing and regulation heavily influenced the drafting of the 1876 Cruelty to Animals Act, the first nationwide legislation in Britain specifically aimed at preventing cruelty to experimental animals and the first to require that scientists formally justify any suffering induced (French 1975; Turner 1980; Ritvo 1987).¹ This legislation remained active for over a century until it was replaced by the 1986 Animal (Scientific Procedures) Act (ASPA). The Act thus had considerable longevity, in the process surviving not only multiple antivivisectionist attempts to repeal it in favour of stricter or abolitionist legislation and but also a Second Royal Commission (1906-1912) in the wake of the Brown Dog Affair. Although elements of its interpretation and administration were repeatedly revised over the decades, the Act's basic framework of appointing government inspectors to visit and assess laboratories for evidence of animal mistreatment and requiring scientists to apply to the Home Office for licenses to experiment on animals, including determining in their applications whether experiments were "calculated to give pain" (1876 Act) and justifying any such suffering, remained in place throughout and have by and large been retained by ASPA.²

But what exactly constitutes pain and suffering for an animal? What differences in sensitivity exist between species? And can we draw a firm demarcation between human and animal sensitivity? In this paper I would like to begin by drawing attention to a troubled attempt at the 1875 Commission by Thomas Henry Huxley, famed defender of Darwinism and the Committee's representative for the scientific community, to make a distinction between human and animal pain. Rather than clearly distinguishing human from animal, however, this proposed demarcation instead highlighted hierarchical presuppositions held by the late 19th century British educated elite regarding alleged differences in sensitivity within the human species. Furthermore, by tying these alleged sensory differences to the conditions of civilisation, Huxley inadvertently enabled fellow commissioner Richard Holt Hutton to argue for exemptions from vivisection for some domestic higher animals on a basis of enhanced sensitivity. Huxley's efforts to demarcate human from animal sensitivity thus exposed the contested and socially constituted understanding of this boundary.

To understand Huxley and Hutton's contestations over human and animal sensitivity, I will employ as an interpretive framework Arnold Arluke and Clinton Sanders' (1996) concept of

¹ The 1876 Act's influence also extended outside of the borders of the United Kingdom, being partially adopted in much of the British Empire (albeit little enforced and with notable exceptions such as India, as discussed in Chakrabarti 2010). As a framework for legislation controlling vivisection, its influence is also evident in subsequent (largely unsuccessful) attempts to introduce antivivisectionist legislation in late 19th and early 20th century Continental Europe and America. For details on the 1876 Act's international legislative and cultural legacy, see Rupke (1987 [Ed.]), in particular the essays by Hampson, which discusses the Act and its influence at home and abroad in the context of its being succeeded by the then recent ASPA; Bromander for its influence on the Scandinavian antivivisectionist movement; Tröhler and Maehle for its influence in Germany and Switzerland; and Lederer for its impact in America. Lederer 1995 offers further detail on the American antivivisection movement and the role of British legislation, animal advocates and pro-vivisection scientists in shaping debate there. For a detailed analysis of the role of transnational solidarity among physiologists and their supporters in resisting antivivisectionist attempts to introduce legislation outside of Britain, see Boddice 2021.

² ASPA's principal innovation has been to formally mandate the 3 Rs (Replacement, Reduction and Refinement), first explicitly outlined in Russell and Burch's 1959 *Principles of Humane Experimental Technique*, which place more exacting emphasis on estimating, quantifying and minimising animal suffering than existed in the 1876 Act (Kirk 2018).

the “sociozoological scale”. Arluke and Sanders argue that societies rank both humans and animals according to how well or poorly they are perceived to ‘fit in’. Animal and human hierarchies are not exclusive of one another but rather intersect with, inform and reinforce one another. I then examine the idea that sensitivity constitutes an organising principle for a specific kind of sociozoological scale that has a particular historical genesis and development, and which privileges particular sociozoological relations and ways of life. Focusing on philosophical, theological and political developments in British society, I will trace this development from its claimed roots in the 17th century to the late 19th century. I will then return to the 1875 Royal Commission, suggesting that recommendations made by the Commission and then formalised in law in 1876 acted to constitute a particular sociozoological order, one which moreover entailed favouring and reinforcing certain narratives regarding sensitivity and the human-animal boundary whilst marginalising others. I conclude by discussing the downstream influence of this constitution and the limitations of the narratives and assumptions that it embodies.

This paper will employ existing literature on the history of British humanitarianism and animal welfare advocacy (Turner 1980; Thomas 1984; Kean 1998; Preece 2007) and on the history of British attitudes towards sentiment and the emotions (Crane 1934; Fiering 1976; Boddice 2016, 2019) in order to help develop an account of the history and sociology of British attitudes towards the relationship between human and animal pain. I also draw on the work of Mary T. Phillips (1993), Joanna Bourke (2014), Cathy Gere (2017), and others who have helped highlight parallels between 19th and 20th century Anglo-American male elite medical attitudes towards animal pain and towards the pain of non-whites, women, the lower classes and the mentally ill. In addition to this historical and sociological analysis, this paper also seeks to contribute to contemporary philosophical and scientific debate about animal sensitivity and laboratory welfare by highlighting the pervasive (and often problematic) historical influence of hierarchical thinking about animal capacity to feel pleasure and pain. This paper finally should be understood as a companion piece to two other papers I have worked on with Carrie Friese (2020; in press) on the enduring influence on British science and society of the 1876 Cruelty to Animals Act.

1: Science and Sensitivity at the 1875 Royal Commission

The immediate source of controversy that led to the 1875 Royal Commission being prompted had been public outcry over experimental demonstrations performed on dogs by the French physiologist Eugene Magnan at the British Medical Association’s annual meeting at Norwich in August 1874. This outcry had however been preceded by a half century of rising humanitarian concerns about apparent Continental physiological cruelty, its alleged demoralising influences, and its possible importation to Britain (see Holmes and Friese 2020). As discussed in my forthcoming paper with Friese, British physiologists had formerly succeeded in defending themselves against charges of cruelty by arguing that they shared the animal loving sentiments (or ‘common compassion’ as Boddice 2016 refers to it), of the wider British population and only reluctantly deployed vivisection, if at all, in order to confirm their anatomical theories rather than as a method of investigation (on Charles Bell’s important role in making such arguments, see Berkowitz 2015). However, as more British physiologists trained in French and German laboratories and moved away from analytical methods in favour of experimental ones, these arguments became harder to sustain. The apparent complicity of British medical men in facilitating Magnan’s demonstrations further suggested to many antivivisectionists that British doctors and scientists no longer shared in their nation’s ‘common compassion’ but rather had, in training in Continental methods,

developed what George Hoggan would refer to at the Commission as “blunted feelings” (Report 1876: 211).

The formation of a Royal Commission followed the failure of competing parliamentary bills to regulate animal experimentation, sponsored by Lord Henniker on behalf of antivivisection and Lyon Playfair on behalf of medical and scientific interests. The selection of the Committee by Home Secretary Richard Cross is discussed in detail by French (1975) and is covered in my 2020 paper with Friese. For the purposes of this paper, I will however briefly dwell here on the selection of, first, Thomas Henry Huxley and, later, Richard Holt Hutton as commissioners.

Huxley was one of the most prominent scientific intellectuals in late 19th century Britain. He is perhaps best known as a champion of evolutionary theory, ‘Darwin’s bulldog’. In this role, Huxley had defended Darwin’s theory of natural selection against claims that it was crassly materialistic and atheistic, both through public advocacy, as famously at the 1860 meeting of the British Association when he debated Bishop Samuel Wilberforce, and philosophically through his promotion of agnosticism, through which he sought to deflate claims of a conflict between Darwinism and theology by stressing the unknowability of metaphysical facts (Lyons 2012). Huxley was also, however, greatly influential on scientific education in Britain, including in the promotion of teaching laboratory-based life science in schools (Lyons 2010) and in helping standardise the training of science teachers in areas such as microscopy (Gooday 1991). As part of this educational advocacy, in 1866 Huxley published one of the first British textbooks for teaching the physiological sciences, *Lessons in Elementary Physiology*. Huxley’s promotion of physiology incorporated strong support for vivisection, including for demonstrative purposes. He had moreover previously in 1870 ardently defended Charles-Édouard Brown-Séquard’s work experimentally induced epilepsy in guinea pigs against accusations of animal cruelty (Huxley 1908: 153). Huxley himself, however, did not practice vivisection, describing it as “personally, indeed I may say constitutionally... extremely disagreeable to me” (Ibid: 159; Boddice 2016: 96).

Despite personal ambivalence about experimenting on animals, Huxley had little sympathy for the upswelling of antivivisectionist agitation preceding the Royal Commission, viewing it as a threat to his achievements in advocating for and helping advance British life sciences and as fundamentally misguided in its motivations. Writing to Cross, he affirmed that “If I can be of any service I shall be very glad to act on the Commission, sympathising as I do on the one hand with those who abhor cruelty to animals, and, on the other, with those who abhor the still greater cruelty to man which is involved in any attempt to arrest the progress of physiology and of rational medicine” (Huxley 1908: 170). Privately, Huxley professed to Darwin that “I vowed I would never be a member of another Commission³ if I could help it, but I suppose I shall have to serve on this” (Ibid). Huxley thus entered onto the Commission reluctantly but with a determination to defend physiology and the British scientific community’s freedom of experimental enquiry against what he perceived as misdirected, even misanthropic, sentimentalism towards animals.

³ Huxley had recently served on the Royal Commission on Scientific Instruction and the Advancement of Science (AKA the Devonshire Commission), which had run for nearly four years from June 1870 to May 1874, as well on the Royal Commission on Contagious Diseases in 1871, the combined workload of which, along with Huxley’s other activities, had left him severely ill and forced him in January 1872 to take a leave of absence, only returning nearly three months later after holidaying in Egypt (Lightman 2014: 101).

One of Huxley's more notable interventions as a commissioner at the 1875 Royal Commission was in support of the views of Dr John Anthony. Anthony was a senior medical witness and former pupil of Charles Bell, who during the first half of the 19th century was Britain's most eminent anatomist and physiologist (Report 1876: 129-130).⁴ Anthony had stated, "it is impossible to deny the evidence that the animals of the lower range do not feel pain as we feel pain", maintaining that "I do not think that the cab horse... when it is whipped, feels exactly as we feel" (Report 1876: 131-132). He justified this claim by citing differences in neurological complexity, asserting that "The lower you go down in the scale of animated nature, the less you find of what we call nervous sensation". When pressed on the matter by commissioners Lord Winmarleigh and Liberal politician W.E. Forster, Anthony however acknowledged that whilst lower animals such as insects probably lacked specialised sensitive nerves, "mammals have the same nerves of organic life [as humans], with a brain superadded; and hence their sensation of pain is very different [from lower animals]". Anthony further admitted that "I should not be able to prove the difference between the man and the animal, they come so near together". In attempting to demarcate human from higher animal pain, Anthony could only point to analogy with the differentiation of nervous organisation and sensitivity seen in the broader natural order (Report 1876: 132-133).

Anthony here appealed to contemporary popular belief in what Bourke (2014) terms the "great Chain of Feeling". This notion of nature as organised on a linear scale of sensitivity, with humans at its summit, was a secularised variant of earlier European beliefs in a 'great Chain of Being' (or *scala natura*) extending downwards from God through angels, humans, animals, vegetables and minerals. Animal life, the 18th century theologian Soames Jenyns wrote, rose from its "low beginning in the shell-fish, through innumerable species of insects, fishes, birds, and beasts, to the confines of reason, where, in the dog, the monkey, and chimpanzee, it unites so closely with the lowest degree of that quality in man, that they cannot easily be distinguished from each other" (Lovejoy 1936: 197). Whilst disallowing its possession in lower animals, Jenyns nonetheless centred rationality as this scale's major organising principle.⁵ This becomes apparent in Jenyns' discussion of human racial and cultural hierarchy. Placing nearest the animal "the brutal Hottentot", Jenyns describes reason as, from this alleged "lowest degree", advancing "with the assistance of learning and science... through the various stages of human understanding, which rise above each other, till in a Bacon or a Newton it attains the summit" (Ibid).⁶

Darwinism has commonly, especially in animal rights literature, been claimed to have challenged ideas of natural hierarchy associated with the *scala natura*, in particular through its recognition of human-animal kinship. This 'myth' has however been extensively criticised by Rod Preece, who points to not only the widespread pre-Darwinian recognition of human

⁴ Anthony was Bell's demonstrator for dissections in his lectures. Anthony did not perform vivisections but later saw vivisection performed whilst studying in Paris in 1838, prior to the introduction of anaesthetics (Report 1876: 129-130).

⁵ It should be noted that Jenyns did also, as Preece notes (2007: 269 & 289), maintain God to have "given many advantages to Brutes, which Man cannot attain", and rejected pretensions of absolute human supremacy over animals, espousing that "we are not in the state of existence as our ignorant ambition may desire". Nevertheless, he did clearly appear to believe human superiority in reasoning to constitute something more than a mere relative advantage over animals – his great chain could conceivably be ordered on principles other than reason that would not place humanity near the summit, but reason nevertheless constituted in his eyes the most salient and divinely sanctioned ordering principle.

⁶ Whilst Jenyns' remark may be taken at first glance as supportive of the possible 'uplift' of 'lower races', James Delbourgo (2012: 198) contends that what actually "ascended for Jenyns were not the Hottentots in their reason, but reason itself, the extent to which lower beings could ascend apparently limited".

animality (e.g. by Linnaeus), but also to continuing assumptions among Darwinians of human superiority and right to power over other animals, particularly in such areas as vivisection (Preece 2007: 331-358). Darwin himself continued to use such categories as ‘higher’ and ‘lower’ animals, and in his *Descent of Man* even spoke of an “ascending organic scale”. (Darwin 2004: 151; Preece 2007: 33-34). On cognition, Darwin likewise maintained that whilst “the mental faculties of man and the lower animals do not differ in kind”, they did so “immensely in degree” (Darwin 2004: 173; Preece 2007: 32). This difference in degree was understood largely in terms of relative brain size (the brain of course being the physical receptacle of Jenyn’s organising principle of reason). On the difference between humans and great apes, for example, Darwin affirmed that “No one, I presume, doubts that the large proportion which the size of man’s brain bears to his body, compared to the same proportion in the gorilla or orang, is closely connected with his higher mental powers” (Darwin 2004: 74). Darwin and followers such as George Romanes furthermore followed physical anthropologists such as Paul Broca in regarding difference in brain size between the sexes and alleged differences between human races and between social classes as also corresponding to differing degrees of cognitive capacity, with white ruling class men such at this cerebral hierarchy’s summit. Boddice has thus rightly described Darwinism as, “despite its radical shaking of certain pillars of the establishment (particularly the church)”, having by and large “sought to account for and justify the status quo” (Boddice 2011a: 333).

Thus when Anthony sought to link differing degrees of sensitivity to differing brain size, remarking that “with a brain weighing 3 lbs. to 4 lbs. the individual would feel pain very differently from what he would if it weighed only a few ounces” (Report 1876: 133), his views not only echoed older hierarchical ideas such as those of Jenyns but also reflected common Darwinian presuppositions about the linear and hierarchical character of cognitive evolution. However, Anthony’s argument not only sought to claim that brain size but also that *intelligence* was correlated with sensitivity, asserting that “you might very fairly take the amount of intelligence as almost a measure of the sensation... you would generally find that the amount of pain [an animal] would suffer from an operation would be in proportion to the intelligence” (Report 1876: 138). He had difficulty, however, convincing lay commissioners Winmarleigh and Forster of a necessary connection between sensitivity and intellect. Here, Huxley intervened, suggesting that the “conviction in the minds of physiologists” that higher animals felt less pain than humans arose “from some four grounds”, which he listed respectively as “the hyper-æsthesia of civilisation”, “anticipation”, “constitutional irritation”,⁷ and “necessary pain” (i.e. purely physiological pain) (Report 1876: 136). Only the last of these did he regard as inherent in all suffering, suggesting the other three to be largely absent in animals.

Huxley’s claims regarding anticipation were shortly afterwards challenged by Forster, who successfully pushed Anthony into acknowledging that higher animals have “some anticipation of pain”, accepting the example of “a dog when once whipped” (Report 1876: 138). This concession made, anticipation disappeared as a point of contention. Huxley’s invocation of “the hyper-æsthesia of civilisation” and the related “constitutional irritation” would, however, come back to seriously trouble his attempts to demarcate animal and human

⁷ Huxley: “Then thirdly, there is a very great source of pain following upon injuries in the human subject, and in the civilized human subject especially, which is what you know familiarly enough as constitutional irritation” (Report 1876: 136). I believe Huxley here refers to trauma, at the time a relatively novel medical ‘discovery’, one which fellow commissioner John Eric Erichsen had played a key role in elucidating as a psychological component of pain (Bourke 2014: 311-316). Though listed present, Erichsen does not comment during Anthony’s testimony.

sensitivity. This was not least because, in entangling both kinds of pain with the nebulous concept of ‘civilisation’, Huxley introduced a category that was principally utilised not to demarcate human from animal but rather to differentiate between human groups. He compounded this problem with the example used to illustrate hyper-aesthesia, remarking to Anthony:

You are doubtless familiar, as every physiologist is, with the fact that one of the most painful events in the life of a woman, parturition, which to civilised women living under ordinary conditions of life involves long hours of agony, is got through by savage women without any inconvenience; that in fact, a savage woman will often get up and carry a burden within an hour after it (Report 1876: 136).

Anthony corroborated Huxley’s assertion, claiming “I have seen that myself abroad” (Ibid).

This analogy from believed insensitivity of ‘savage’ humans to inferred insensitivity of animals was problematic not just because of its racist nature but also because it attempted to draw a line between humans and animals based on comparisons between different groups of humans. Either ‘savages’ were on the same side of the boundary as ‘civilised’ people, in which case extrapolation to the animal was dubious, or else they were on the same side as animals, in which case Huxley might appear, in arguing for physiologists’ right to vivisect animals, to also argue for the right to vivisect ‘uncivilised’ and otherwise animalised humans. This latter interpretation played into the arguments of radical antivivisectionists such as George R. Jesse, who grimly warned the Commission that unless vivisection was criminalised its practitioners would “not... stop with the *animals* in their experiments”, and that “what has been done in America may be done here, and the very poor and friendless be experimented on” (Jesse 1875: 125).⁸

On the other hand, by arguing that civilisation intensified sensitivity, Huxley also opened the way for his fellow commissioner, *Spectator* editor and moderate antivivisectionist Richard Holt Hutton, to argue that domesticated higher animals should be exempted from vivisection on grounds of also being subject to civilising influences. This would not be the first time that Huxley and Hutton would be on opposing sides in arguments over science and ethics. Both had been founding members of the Metaphysical Society (1869-1880), an exclusive London debating club that met nine times a year to discuss philosophical and theological matters, with the ostensive aim of seeking common ground between scientific and religious interests and an implicit political purpose of cultivating ideological solidarity among a British elite divided on matters of faith and fearful of working-class unrest (Marshall 2012). It was at these Society meetings that Huxley would first utilise ‘agnostic’ as a self-descriptor, indicating his rejection of the possibility of ‘gnosis’ (i.e. supersensory knowledge of fundamental reality), but also distancing himself from materialism and atheism. Hutton, a formerly Unitarian Christian undergoing a slow conversion to a more conservative Anglicanism,⁹ recognised agnosticism to be distinct from, and preferable to, atheism,

⁸ It is not clear whether Jesse here refers to the infamous history of medical experiments conducted on slaves in the antebellum South by surgeons such as J. Marion Simms (Savitt 1982), or contemporaneous outrages such as the 1874 case of Mary Rafferty (see Lederer 1995: 7-9 for details).

⁹ On Hutton’s movement away from Unitarianism, see Goslee (2011). Hutton’s concerns about the corrosive influence of agnosticism and scepticism on religious faith may be linked to his disillusionment with a Unitarian community whose younger generations were, in the words of leading theologian James Martineau, “seldom... settl[ing] into... devout natural religion”, becoming “positivists, pantheists, atheists, agnostics... Or else they float about in a life-long doubt” (Goslee 2011: 59).

characterising it as “a sort of know-nothingism... or belief in an unknown and unknowable God” (Lightman 2002: 276).¹⁰ He furthermore treated Huxley’s avowals of strong religious sensibility and reverence for Christ as sincere, even in the wake of the 1876 scandal over Huxley’s Metaphysical Society paper ‘Evidence of the Miracle of the Resurrection’ wherein he cast doubt on the claim Jesus died on the cross (see Dawson 2019: 111). Hutton however considered Huxley’s professed belief in the necessity of suspending judgement as at odds with his missionary zeal in promoting scientific naturalism, mocking Huxley’s “Papal”¹¹ tone and “dogmatic decrees” (Lightman 1987: 120-121).¹² Hutton also expressed doubts as to the compatibility of agnosticism and religious faith, later confessing puzzlement in his 1895 obituary for Huxley that he could “reverence so profoundly the man [Christ] who taught the creed most opposed to his own that ‘Skepticism is the highest of duties, blind faith the unpardonable sin’” (Hutton 1895a: 32).¹³

In addition to his conflict with Huxley and other ‘sceptical scientists’ over agnosticism, Hutton was also deeply opposed to Darwinian efforts to apply evolutionary theory to human morality. His first paper at the Metaphysical Society in 1869 was dedicated to attacking Herbert Spencer’s¹⁴ attempt to reconcile utilitarianism and intuitionism (the two accounts of morality then most popular in Britain) through an evolutionary account of the development of our moral intuitions as the Lamarckian inheritance via instinct of our “the accumulated experiences of Utility”. Hutton was a committed intuitionist who held human beings to have a God-given inherent faculty for apprehending right and wrong (Hesketh 2019). Human conscience, he insisted, was neither “an heirloom derived from ancestors for whom it had an objective use which it has lost with us” nor “a false superstition [that] has indefinitely benefited the race”. As the structure of the eye implied adaptation to perceiving light, he held, so the structure of conscience implied “a spiritual presence and judgment, the access of some being to our inward thoughts and motives” (1872: 133-136). Whilst Hutton did not reject the existence of natural selection in the animal and plant world, he vehemently insisted that when it came to “our own moral life”, “completely new principles and laws begin. Natural selection yields in man to pity and reverence; the law of competition is qualified and partly merged in the law of sacrifice”. He went on to insist that “if we were the mere products of natural selection, and had no access to any store of diviner counsels, how could the Christian ideal of life ever have developed itself from such roots as these?” (1874: 51-53).

¹⁰ Lightman (2002: 275-276) notes that up until 1878 Huxley himself used ‘agnostic’ little outside of the Metaphysical Society, and that it was in fact Hutton who helped popularise the term and its association with Huxley and other scientific sceptics such as Tyndall. Huxley later acknowledged Hutton’s influence, remarking that “the *Spectator* had stood godfather” to the term.

¹¹ One of the first articles to appear in the popular press in which the term ‘agnostic’ was used was Hutton’s January 1870 ‘Pope Huxley’ in the *Spectator* (Lightman 2002: 276).

¹² See also Hutton’s 1895 essay ‘The Great Agnostic’, where on the late Huxley he asserts that “To me he is the great Agnostic who has tried, and, as I hold, tried in vain, to regard physical science as the one sure guide of life, and has yet betrayed in some of the most critical utterances and actions of his career, that his Agnostic creed did not cover the whole of the legitimate evidence” (Hutton 1895b: 106).

¹³ For more on antivivisectionists and the perceived dangers of scientific scepticism to religious faith and the morality and humanity of scientists, see mine and Friese’s paper (in press).

¹⁴ Spencer was a key influence on Huxley’s agnosticism, his 1860-1862 *First Principles* retrospectively coming to be regarded as “the agnostic Bible”. Spencer dedicated the first instalment of this book to discussion of ‘the Unknowable’, his equivalent of the Kantian ‘thing-in-itself’ or Hegelian ‘Absolute’. Hutton’s description of agnosticism as “belief in an unknown and unknowable God” conflates Huxley’s rejection of gnosis with Spencer’s veneration of the Unknowable. However, by the late 1860s, Huxley had become less sympathetic to Spencer and can, in designating himself as rejecting ‘gnosis’, in fact be seen as attempting to distance himself from Spencer’s positive identification of the Unknown as an existent entity worthy of worship (Lightman 1987: 81-90 & 136-139).

Hutton's opposition to vivisection can thus be understood as motivated both by concerns about the potentially demoralising influence of atheistic scientific materialism, the threat of which he saw as lurking behind the avowed scepticism and agnosticism of leading British scientists, and by his opposition to utilitarian and evolutionary ethics.¹⁵ Hutton, like the Darwinians, believed in a hierarchy of beings, in a later article describing animals as "fellow-creatures in the ranks of life below us" (1882: 38). He also endorsed human hierarchy, believing that whilst the "lower races of men" might have an innate capacity for moral conscience that this was not fully actuated prior to the development of 'civilised' religion (1872: 134).¹⁶ However, whereas physiologists invoked hierarchy to justify the greater priority of (civilised) human suffering and the acceptability of sacrificing animals for this greater good even if it required inflicting pain, Hutton maintained that "if we are to separate the lower races of animals so entirely from man, that we may inflict any amount of anguish upon them purely for our own benefit... we sever all ties of sympathy with the lower races of animals", something he regarded as "utterly destructive of the true tie between all sensitive beings" (including, implicitly, other humans) (1882: 38).

At the 1875 Royal Commission, Hutton thus sought to defend the 'lower races' against vivisection by attempting to draw contradictions out of the evolutionists' account of sensitivity. "With reference to that hyper-aesthesia of which Professor Huxley has spoken as existing in man", Hutton queried Anthony, "does not it exist in the higher bred lower animals too; for instance, there is almost as much difference in regard to suffering between a high bred dog or horse and a low bred one, as there is between an Englishman and a savage, is there not?" Here Anthony conceded that both Englishman and English pointer had been brought "under the particular conditions of the influence of civilisation", with the pointer's olfactory senses and organs becoming elevated in sensitivity, and "as you have educated that dog... so his feelings would be modified" (Report 1876: 137-138).

Anthony himself was unconvinced that hyper-aesthesia could be extended beyond specific individuals and breeds, maintaining that "taking the mere genus" one would find not all animals of the "same excess of sensation", with bulldog and Italian greyhound, for example, "entirely at opposite ends of the scale". Hutton, however, argued that the existence of hyper-aesthetic individuals of their species constituted firm grounds for "excluding horses, dogs,

¹⁵ It should be emphasised that this was not to the exclusion of genuine concern about animal suffering. Hutton for example asks that we should "put ourselves in the place of the lower animals, and ask what we, with their pains, and their sensitiveness, and their prospects of life, and pain, and happiness, might fairly expect of beings of much greater power, but of common susceptibilities" (1882: 37-38). He elsewhere derides the "fashion" among physiologists of "speak[ing] in the most minimising and depreciating tone of the probable amount of pain suffered by the victims of physiological experiment" (1882: 35). Whilst it is true that much antivivisectionist anxiety was motivated by the perceived moral effects of vivisection on scientists and society, and that some concern was misplaced due to experiments imagined as hideously cruel in fact taking place under anaesthesia, issues often elided in historiography written by animal advocates, there has been a similarly problematic tendency in historiography written by supporters of physiology to cast doubt on or downplay the genuine character of antivivisectionists' love of animals, as perhaps best exemplified in French's (1975: 412) characterisation of them as protesting not animal experiments but rather "the cold, barren, alienation of a future dominated by the imperatives of technique and expertise".

¹⁶ This can be seen in his assignation of the proper beginnings of religious conscience to "men in general, when past the savage stage and short of the scientific stage" (1872: 132), and his related assertion that "From all we know of the lower animals, and even of the lower races of men, this apprehension of a spiritual presence to which their thoughts and hearts are open, is certainly not an inheritance derived from them, but an acquisition of man himself in his higher stages of being" (Ibid: 134).

and cats generally” from vivisection (Report 1876: 138). Writing in a minority report, Hutton later remonstrated that

it will be impossible to draw fine distinctions in such cases... and as it is notorious that no class of animals otherwise convenient for experimentation contains so many creatures of high intelligence, and therefore probably of high sensibility, as dogs and cats, it seems to me desirable, in consideration of this special sensibility, to exempt these members of our households from all liability to such experimentation (Report 1876: xxii).

2: The Sociozoological Scale

Whilst it might be argued that Hutton’s arguments for excluding companion animals on grounds of hyper-aesthesia were mere sophistry and were rejected by his fellow commissioners (hence their presence in a minority report), it is worth noting, firstly, Hutton’s long-standing and serious engagement with Huxley and other prominent British intellectuals in arguments surrounding evolution and ethics, and further that he returned to this argument, albeit briefly, in his 1882 paper ‘The Biologists on Vivisection’ (1882: 36).¹⁷ Moreover, even if we treat his arguments as rhetorical they still, I argue, offer insight into the complicated and contested character of Victorian gentlemanly understandings of the human-animal boundary and of moral obligations to ‘the lower races’. In particular, these debates at the 1875 Commission highlight not only the difficulty of measuring sensitivity across species boundaries but also how human observers will often draw on observations about other humans in assessing animal capacity and social value.¹⁸ Human stand-ins for the animal are commonly from groups regarded as culturally or biologically underdeveloped or socially undesirable, the inference being made that they are ‘closer to the animal’.

Arluke and Sanders (1996: 167-186) term this manner in which societies index multispecies hierarchies of humans and animals the ‘sociozoological scale’. Societies, they observe, “rank everything on a ladder of worth, including people and animals, and systems of social control perpetuate these rankings”. These hierarchical social orders justify unequal treatment of those at different tiers in the scale, favouring those at the top and excusing exploitation of those at the bottom. Animals are both subjects of these scales and also symbols through which humans think about social hierarchy and codify morals and norms (on the use of animals as tools for thinking, see also Daston and Mitman 2006). These sociozoological systems differ from modern scientific systems of classification¹⁹ such as cladistics in that rather than ordering animals based on biological differences, they rather rank them “according to how well they seem to ‘fit in’ and play the roles they are expected to play in society”. ‘Good animals’, which Arluke and Sanders sub-divide into the categories ‘pets’ and ‘tools’, “have high moral status because they willingly accept their subordinate place in society”. ‘Bad animals’, distinguished into ‘freaks’, ‘vermin’ and ‘demons’, by contrast have low moral

¹⁷ Wherein Hutton perhaps gives fuel to the claim his appeal to hyper-aesthesia was rhetorical in stating that “Suffering of some kind is the fate of all mortal beings; and, indeed, the sufferings of wild animals which have no association with man are probably quite as severe, and not nearly so ennobling, as the sufferings of domesticated animals when humanely trained by those who have a true sympathy for them” (1882: 37).

¹⁸ The reverse also holds that animals and subordinate humans are often used as negative references in order to mark out by contrast the qualities of ruling human classes. Of particular relevance here is Boddice’s discussion of the Victorian ‘manly’, or ‘gentlemanly’, mind, which could be distinguished only via imagining a ‘non-manly mind’ “through a combination of the intellectual weakness of woman, the immaturity of the child, the uncivilisedness of the savage and the raw passion of the animal” (2011a: 334).

¹⁹ For a review of how considerations of usefulness influenced early modern and pre-Darwinian taxonomies in Britain, see Ritvo 1990.

standing “because their subordinate place is unclear or because they no longer remain quietly out of sight and distant from people” (Arluke and Sanders 1996: 169-170).

These animal rankings are not exclusive of human social hierarchies but rather intersect with, inform and reinforce them. Notably, subordinate human groups may be dehumanised and treated as ‘bad animals’ because they lack a place or refuse an assigned position in the social order. Arluke and Sanders cite the treatment of Jews and other immigrant groups as ‘vermin’ in late 19th century America and note that this xenophobia was coupled with persecution of sparrows, which likewise were accused of being “dirty, bad, and morally suspect and, therefore, ‘out of place’ in the clean and morally upright culture of America” (Arluke and Sanders 1996: 178-180). Such dehumanisation has historically been supported in western societies by entrenched ideologies of racial, biological and psychosocial hierarchy that purport non-whites, women, criminals, the mad and other subordinate groups to be inferior to predominantly white male ruling elites through being closer to the animal. Dehumanisation can even entail raising humanised animals above the standing of animalised humans. Arluke and Sax point to Nazi Germany, which extended animal protections against vivisection and hunting even as it discriminated against and attempted to exterminate human groups such as Jews, Gypsies, homosexuals and the disabled. For the Nazis, as one SS document proclaimed, “The subhuman... [although] seemingly quite identical with the human... is merely an attempt at being man – but mentally and emotionally on a far lower level than any animal” (Arluke and Sax 1992: 25). The regime was by contrast lauded by supporters as transforming the social treatment of animals from being “objects of personal property... with which a man may do as he pleases”, to being “pieces of living nature which demand respect and compassion” (Arluke and Sax 1992: 11).

3: Western Anthropocentrism, the Human-Animal Boundary and the Matter of Moral Patiency

Nazism offers an extreme example of a dehumanising ideology. Concerns about the animalisation of human outgroups, and the associated threats of exposure to abuse and persecution, however, have a much longer history within western ethics. I suggest that, perversely, one reason why animalisation poses such a threat to marginalised human groups is precisely because of the anthropocentric standards that in western societies have historically informed most norms of social participation.²⁰ Through informing who is a social actor and their actions’ remit, such standards contribute to delimiting social boundaries to moral agency and constituting political subjecthood.²¹

²⁰ The following arguments in this section draw partly on Maria Kronfeldner’s discussion of the relationship between dehumanisation, essentialism and what she calls “the vernacular concept of human nature” (see Kronfeldner 2018: 15-32). Animalisation as used in this essay should be understood as a sub-category of dehumanisation, being related but distinct from those forms of dehumanisation that treat human beings as ‘things’ or tools (e.g. Roman law’s treatment of slaves as *res*; see Graeber 2011: 199-201).

²¹ Anthropocentrism as a form of political ordering is, it should be noted, distinct from the anthropocentric as an ontologically grounded perspective. Following Boddice, we can conceive of political anthropocentrism “emptied of its overtones of dominion”, but we cannot similarly empty the anthropocentric perspective of its ontological content. Even if we were to ‘do away with hierarchy’, we would still perceive and evaluate the world from a human point of view (Boddice 2011b: 7-8). In lieu of possible confusion, when I speak about ‘anthropocentric standards’ I am explicitly referring to anthropocentrism as a political orientation which, as I discuss below, usually assumes human hierarchy over animals and also privileges some humans over others on the basis of perceived approximation to an ideal ‘Human’ and away from a denigrated ‘Animal’ (although, as Sax 2011 emphasises, ‘Animal’ has not been the only contrast category employed to demarcate the ‘Human’, others including the human/deity contrast and the human/machine contrast).

For Aristotle, an important early influence on western political philosophy, humans differed from other creatures in being ‘political animals’.²² Other animals were not participants in the *polis*, but rather “exist for the sake of man, the tame for use and food, the wild... for food, and for the provision of clothing and various instruments”. Aristotle furthermore maintained that animals lack reason, which he thought requisite to attaining life’s highest end, virtue. To serve virtue’s ends, therefore, animals had to serve human ends and so were perfected in being brought under human mastery (Aristotle 1908-1931: 2796-2802). Being animal thus entailed being subject to mastery and becoming property, whereas being human entailed a natural right to dominate and exploit animals. The human-animal boundary for Aristotle thus served to help constitute the boundaries of moral-legal subjecthood and associated rights within the Greek *polis*.

Anthropocentric standards thus privilege humans over animals.²³ However, because they also typically privilege particular traits as characteristically or desirably human, these standards also tend to privilege certain kinds of human over others. Anthropocentric standards, in other words, are usually also ethnocentric, gendered, classist, ageist and/or ableist in character, even if appeal is principally to the abstract ‘Human’.²⁴ Consequently, those outside the sphere of these standards risk being animalised. Returning to the ancient world, Aristotle maintained that not only was the human use of tame animals and of slaves by masters analogous, since “both with their bodies minister to the needs of life”, but moreover, just as nature had made other animals for humanity’s sake, so had it also made humans (namely non-Greek barbarians) who were naturally servile and thereby best fitted for slavery (Ibid; Pellegrin 2013). In combining anthropocentric and ethnocentric standards, Aristotle thus attempted to justify a sociozoological order that both bound human from animal and also bound free Greek from servile barbarian in a manner that animalised the latter group.

One strategy employed by those wishing to defend marginalised humans against animalisation has been to stress an asymmetry between moral agency and moral patiency. ‘Moral patiency’ is here defined as an entity’s possession of qualities entitling it to moral consideration by agents (see McPherson 1984 for further discussion). Ethicists concerned about animalisation have sought to identify qualities entitling beings possessing them to moral consideration, but which do not depend on capacity for full social participation. This shaping and reshaping of the sociozoological scale through identifying and selecting qualities entailing moral consideration can be considered a form of co-production and co-constitution of knowledge and society (Jasanoff 2004).

²² This category of ‘*zōōn politikon*’, was, Preece emphasises, not merely descriptive but normative – humans are made by nature to live in a *polis* but if they fail to live in a virtuous manner befitting political life they in effect become subhuman, as Preece argues Aristotle indicates in his assertion that “Man, when perfected, is the best of animals; but if he be isolated from law and justice he is the worst of all” (Preece 2007: 58-59). This claim that extra-political peoples are subhuman is also of course implicit in Aristotle’s arguments for natural slavery.

²³ On anthropocentrism, Çubukçu (2017: 261-262) observes “While humanist arguments are often made for the extension of care and solidarity to animals, it is their degree of similarity to humans – whether measured through animals’ capacity to feel pleasure or pain or their intelligence – that grounds such pleas for the ‘humane’ treatment of animals”. She maintains that, in utilising anthropocentric standards, “these arguments leave intact the hierarchical positioning of the human above the animal, while they also order different animal species hierarchically according to their various degrees of proximity to what is taken to be the essence of humanity”.

²⁴ As La Capra remarks, “the human-animal divide is often premised on a dubious comparison between an idealized rights-bearing ‘normal’ human – usually a healthy adult in possession of his or her faculties – and an excessively homogeneous category of the animal” (2009: 151).

Particular grounds for moral patiency privilege particular ways of life and social relations. Appeals to intelligence privilege those with access to education and training. Appeals to past capacity for social participation offer more favourable grounds for the rights of the old and permanently incapacitated, whereas appeals to future capacity to participate better favour the rights of children, the unborn, temporarily incapacitated, and socially stigmatised groups such as criminals and refugees. The identification and selection of qualities for moral patiency is moreover subject to social prejudice, received wisdom and power relations. The validity of intelligence testing has for instance been contested on the grounds that the selection of testing parameters was historically shaped by racist and classist assumptions (Gould 1984).²⁵ Sensitivity, like intelligence, has been a subject of both testing and contestation, with existing prejudices and power relations playing an important role in how sociozoological orders based on sensitivity are stabilised and constituted.

Whilst qualities selected for moral patiency are generally human-oriented and usually selected with marginalised humans in mind, they often, being selected based on their ubiquity across the human species, also apply to many nonhuman animals. Efforts to secure the moral patiency of marginalised humans against animalisation have thereby often had the effect of extending moral patiency across the human-animal divide and thereby troubling the anthropocentric standards that have historically constituted western political subjecthood. Interrogating Steven Shapin and Simon Schaffer's 1985 thesis that "solutions to the problem of knowledge are solutions to the problem of social order", we here find that solutions to the problem of moral patiency, whilst ostensibly consolidating social order by resolving anxieties regarding marginalised human groups, can in other ways destabilise social order by challenging assumed human privilege over animals. Beginning in early modern Britain and tracing forwards towards the 1875 Royal Commission, I will now examine how sensitivity came to both help constitute moral patiency and political subjecthood and also, through being employed to both challenge and reinforce anthropocentric and ethnocentric social norms, complicate boundaries between human and animal and between different human groups.

4: "The Exuberance of Compassion" – Animals and the Anti-Hobbesians

Whilst the idea that unwanted suffering should be ameliorated or prevented where possible may seem commonsensical, it has, so James Turner (1980) has argued, not always been predominant in British society. During the Tudor and early Stuart periods, Christian ideologues often rationalised suffering as punishment for original sin. This included animal suffering, which in one Jacobean bishop's words was "not their punishment, but a part of ours" (Thomas 1983: 18). As with Aristotle, this to some extent reflected anthropocentric social standards whereby animals were viewed as created for human use and edification, and not for their own sake.²⁶ The fatalist providentialism of much of Lutheran and Calvinist

²⁵ Appeals to past and future social participation as grounds for moral patiency for those currently unable to fully participate meanwhile commonly perpetuate ableist assumptions and discrimination even against those they ostensibly are attempting to safeguard, e.g. arguments for respect towards socially impaired disabled people on the grounds that they might one day be 'cured'.

²⁶ Preece (2007) has staunchly argued against the tendency in much animal advocate historiography to narrate a linear historical progress from benighted archaic anthropocentrism to enlightened contemporary animal rights. As he elaborates in great details, proponents of kindness of animals and theriophilia have existed throughout the history of western civilisation. He is furthermore deeply critical of the claim that Christianity especially inculcated strongly anthropocentric values justifying the exploitation of animals and nature, as popularised by Lynn White Jr. in his 1967 paper 'The Historical Roots of Our Ecologic Crisis' (discussed on Preece 2007: 284). Nevertheless, as discussed in Thomas (1984: 17-36), highly anthropocentric standards were prevalent, if far from universal, in 17th century Britain (although the same can be said for much of British history before and since) and commonly justified in Biblical terms.

Protestantism further contributed to a widespread quietist attitude to pain in early 17th century British society (Thomas 1971: 90-132; Wilkinson and Kleinman 2016: 31-33). Providentialism, however, declined after the Restoration, supplanted by a more voluntarist and ecumenical Protestantism associated with the Latitudinarian ecclesiastical movement. Latitudinarian preachers were not, however, only concerned to counter Puritan Providentialism but also attacked the doctrines of the political philosopher Thomas Hobbes. It is in these anti-Hobbesian arguments that R.S. Crane (1934) influentially suggested that the origins of the 18th century turn towards ethical sentimentalism can be found.

Hobbes' 1651 *Leviathan* is often cited as a foundational text in the canon of modern western political philosophy. Hobbes famously claimed that without "a common power to keep them all in awe", men are naturally in a state of war. To establish government required that warring parties come together and establish covenants, whereby they agree to invest a particular individual or assembly with the power of sovereignty (Hobbes 1996: 82-86). Participation in civil society and political subjecthood were for Hobbes dependent on this capacity to covenant. Hobbes thereby denied animals political subjecthood on the basis that "To make covenants with brute beasts is impossible, because not understanding our speech, they understand not, nor accept of any translation of right, nor can translate any right to another: and without mutual acceptation, there is no covenant" (Hobbes 1996: 92). For Hobbes, this lack of covenant entails that humans neither have an inherent right to dominate animals nor do animals have a right to be protected against humans. Human-animal relations are instead characterised by "hostility", i.e. the imposition of power, and those animals subjugated by human power are thereby wholly dependent on human magnanimity for any protections they are granted (Hobbes 1841: 187-188). For similar reasons, Hobbes also denied political subjecthood to those humans lacking the means to recognise the law, stating "Over natural fools, children, or madmen there is no law, no more than over brute beasts" (Hobbes 1996: 166). Hobbes' account of covenant likewise entailed that those beyond or excluded from the bounds of the state were similarly subject to relations of hostility.

Against Hobbes' bleak worldview, Latitudinarian preachers argued that "*Men*" were not "*naturally in a State of War and Enmity with one another*", but rather were "*naturally a-kin and Friends to each other*". "[P]ity and benignity" were "natural inclinations" implanted in human nature "by the most wise and good Author of our being". This natural benevolence was self-evident, for "when we see a miserable Object, Nature it self moves our Bowels to Compassion, and our Hands to give" (Crane 1934: 223-225, quoting the divines Tillotson, Barrow and Isham respectively). For these Churchmen, humanity was naturally good natured and ordinary morality consisted simply in following fellow feeling. Lacking political subjecthood did not thereby entail being exposed to relations of hostility. Whilst this centring of sentiment was principally aimed at countering Hobbes' pessimistic interpretation of human-human relations, intuitively animals also qualified as 'miserable objects' demanding sympathy. That "animals began to benefit" from this "exuberance of compassion" (Turner 1980: 7), is suggested by the Earl of Shaftesbury's 1711 condemnation of "delight in the torture and pain of other creatures... of our own or of another species" as an "unnatural passion", "horrid and miserable" (Fiering 1976: 202).

Whilst this animal-friendly sentiment may have had roots in religious change, it would soon also be embraced by more secular British moralists. One factor in this was opposition to the French philosopher René Descartes' 'beast machine' doctrine, whereby animals were claimed to be mere automata lacking sentience. Of a bullock being slaughtered, Bernard Mandeville questioned "what Mortal can without Compassion hear the painful Bellowings intercepted by

his Blood, the bitter Sighs that speak the Sharpness of his Anguish, and the deep sounding Groans with loud Anxiety fetch'd from the bottom of his strong and palpitating Heart". "When a Creature has given such convincing and undeniable Proofs of the Terrors upon him, and the Pains and Agonies he feels", he concluded, "is there a Follower of Descartes so inur'd to Blood, as not to refute, by his commiseration, the Philosophy of that vain Reasoner?" (Shugg 1968: 288).

For Mandeville, it was not merely that the animal was a 'miserable object' enjoining him to respond compassionately to it – rather, he recognised it as a sensitive being like himself. It was this sensitivity that raised it above the horizon of moral consideration. This act of sympathetic recognition would later become the cornerstone of David Hume's naturalistic account of morality. Hume replaced reference to a designer God with a psychophysiological empiricism of the senses whereby sympathy was emergent from our interactions with other beings in the world. Hume thus helped complete what Fiering (1976: 198) terms the "secular sanctification of compassion". But matters of sympathy and moral action were complicated by entanglement with class and racial prejudices, as I now discuss.

5. Sensitivity, Reason, Class and Race

Latitudinarian belief in natural human benevolence towards animals had met with scepticism from some observers. Citing the popularity of blood-sports, Alexander Pope protested that taking pleasure in animal suffering was "almost a distinguishing character of our own nation", with even young children participating in it (Pope 1713: 90). One response to this challenge was to suggest human intuition to be naïvely benevolent but as requiring training and discipline to avoid perversion by dissolute temperaments. The mid-18th century Scottish moral philosopher Francis Hutcheson, on whose work Hume heavily drew, viewed human nature as intrinsically good but subject to vicious passions requiring "balanc[ing] out by divinely established benevolent affect" (Fiering 1976: 207). This notion of moral character as inborn *in potentia* but needing to be moulded through educating restraint was popular among the rising classes of bourgeois professionals and skilled tradesmen to which philosophers such as Mandeville and Hume belonged, and became an important facet of 18th century British social and economic 'improvement' movements' ideology of the 'self-made man' (White 2007).²⁷

One work exemplifying this ideology was William Hogarth's 1747 *Industry and Idleness*, wherein two apprentices originally working side-by-side respectively ascend and descend in society through virtuous and vicious deeds, until 'Francis Goodchild' becomes Lord-Mayor of London, whilst 'Tom Idle' hangs at Tyburn (Ireland and Nichols 1874: 268-296). Notably, Hogarth later argued in 1751's *Four Stages of Cruelty* that violent treatment of animals could, like idleness, induce a similar descent into viciousness. Illustrating the life and death of 'Tom Nero', cruelty to animals is shown as first appearing as a symptom of corrupted childhood innocence, then when uncorrected leading in adulthood to immorality and brutality. This process of 'demoralisation' leaves both animal and human victims, including Tom's abused coach horse, his lover Ann Gill, and Tom himself, who after hanging for murder is ghoulishly dissected in an anatomy theatre (Ireland and Nichols 1883: 50-64; Boddice 2019: 132-144).²⁸

²⁷ Hutcheson's work also remained a key reference point for late 19th century intuitionists such as Hutton and fellow antivivisectionist Frances Power Cobbe.

²⁸ Boddice contends that it is actually the surgeons in the fourth engraving, 'The Reward of Cruelty', who represent the epitome of demoralisation, and that further Hogarth is less warning about the dangers of cruelty

It is no coincidence that Tom Nero is a coachman by trade – working-class men dependent on animals for their living were thought particularly vulnerable to demoralisation. Butchers and drovers are also seen partaking in acts of animal cruelty in the background of the second of Hogarth's Four Stages. Demoralisation was believed to entail both lesser sensitivity to pain in others and in oneself. Criminals, for instance, were often thought better able to withstand torture, as seen in natural theologian William Wollaston's 1722 protestation that corporal punishment was cruel because it was based on what "a stout, resolute, obstinate, hardened criminal may bear", not on what "the weaker sort" of human being could tolerate (Fiering 1976: 206). These prejudices against men working with animals and criminals reflected bourgeois belief in a class hierarchy of sensitivity and rationality wherein they conveniently occupied a golden mean. Hume explicitly held men of "the middle station" to be the most apt philosophers, for whilst "The great are too much immersed in pleasure, and the poor too much occupied in providing for the necessities of life", the middling had the combined sobriety and security to "hearken to the calm voice of reason" and exercise virtue (Hume 1998: 5-6).

Hume however acknowledged that within his own society "low people, without education" could "start up amongst us, and distinguish themselves in every profession" (Garrett and Sebastiani 2017). Class hierarchies within Britain were therefore, in Hume's view, flexible for those who dedicated themselves to self-improvement through education and hard work. This was not the case, Hume believed, with racial hierarchies. "I am apt to suspect the negroes", he remarked in 1753, "and in general all the other species of men... to be naturally inferior to the whites". Unlike white social inferiority, Hume thought this "natural inferiority" not amenable to education or training. He maintained that black slaves brought up in European conditions showed no "symptom of ingenuity", even dismissing a renowned black Jamaican intellectual as likely "admired for very slender accomplishments, like a parrot, who speaks a few words plainly". Hume's grotesque use of animal analogy to dismiss the possibility of black social uplift was not accidental but rather integral to his racial theory – the differences between human races, he maintained, resembled those between domestic animal varieties, as in horses, which "always show their blood in their shape, spirit, and swiftness" (Ibid). Hume's polygenist sympathies were likely influenced by the increasingly hereditarian views of animal breeders (another facet of British improvement culture) (Russell 1986; Wood 2007). British discourse about improvement and its limitations was thus not just social and racial in outlook but also sociozoological.

Hume's animalisation of non-whites and dismissal of their possible 'improvement' was controversial even in his own time. He received particular derision from abolitionist James Beattie, who scathingly remarked "Learn, Mr. Hume, to prize the blessings of Liberty and Education, for I will venture to assure you that had you been born and bred a slave, your Genius, whatever you may think of it, would never have been heard of" (Garrett and Sebastiani 2017). Beattie's excoriation of Hume should not disguise the fact that he also accepted white cultural supremacy as fact. Whilst denying the "natural inferiority of negroes", he nevertheless accepted the claim that blacks and native Americans were barbarians (Beattie 1778: 462-468). Both Hume and Beattie thereby agreed on the existence of hierarchy between races, reflecting broader societal belief in a 'great chain of being' centred around reason. Disagreement chiefly centred on whether, as Hume argued, the 'lower

(the deliberate pleasure in inflicting pain) so much as the danger of *callousness* (unfeeling apathy towards suffering in others).

racess' were fixed in place by nature, or, as Beatty maintained, capable of 'uplift' through the assistance of European civilisation.

Other abolitionists, however, challenged the centrality of reason and in the process laid the foundations for more radical critiques of the contemporary sociozoological order. For English philosopher Jeremy Bentham, pain and pleasure, placed upon humankind by nature as "two sovereign masters", were "alone to point out what we ought to do, as well as to determine what we shall do" (Bentham 1789). Regarding sensitive beings, human and animal, Bentham held that "the question is not, Can they reason? nor, Can they talk? but, Can they suffer?" (Ibid; Thomas 1984: 176). Drawing a direct analogy between slavery and animal cruelty, Bentham maintained that just as "the blackness of the skin is no reason a human being should be abandoned without redress to the caprice of a tormentor", so "the number of the legs, the villosity of the skin, or the termination of the *os sacrum* are reasons equally insufficient for abandoning a sensitive being to the same fate" (Bentham 1789). Sensitivity thus constituted the *raison d'être* for moral action and all beings possessing it deserved moral consideration regardless of racial or species differences.

This did not, however, imply a rejection of hierarchy by Bentham or of the use of animals for human purposes. As Preece notes (2007: 311), Bentham later clarified that he thought "it ought to be lawful to kill animals, but not to torment them", and that, needless cruelty aside, causing animals pain through exploiting and killing them was generally justifiable as "their pains do not equal our enjoyment. There is a balance of good". As Boddice (2010: 475) notes, in 1825, in the wake of outcry in Parliament over Francois Magendie's performance of vivisections whilst visiting London, Bentham even expressed support for animal experimentation, stating in a letter to the *Morning Chronicle* that he had never had "any objection to the putting of dogs and other inferior animals to pain, in the way of medical experiment, when that experiment has a determinate object, beneficial to mankind, accompanied with a fair prospect of the accomplishment of it".²⁹ The reorganisation of the sociozoological scale on the basis of sensitivity, whilst opening the way for 'irrational' beings to be recognised as moral patients, thus did not in itself necessarily lessen the influence of anthropocentric standards.

6. The Great Chain of Feeling and the Darwinian Account of Sympathy

It is perhaps unsurprising that one response to abolitionists and humanitarians' centring of sensitivity were efforts by beneficiaries of exploitation to sow further doubts regarding the capacity of subordinate races and species to feel pain. A "Professional Planter" (Collins 1803: 232-233; Bourke 2014: 302) maintained that, although there were no significant anatomical differences between black slaves and their white masters, "there is reason to think that the sensibilities, both of their minds and bodies, are much less exquisite than our own; as they are able to endure, with few expressions of pain, the accidents of nature, which agonize white people" (1803: 232-233). This extension of belief in class differences in sensitivity to, in a colonial context, black slaves and 'savage' races, was also increasingly applied in a metropolitan context to animal breeds, particularly dogs. As Harriet Ritvo (1987: 84-93)

²⁹ Whilst I was surprised to find out, thanks to one of my reviewers pointing the way, that Bentham had endorsed vivisection, I should perhaps not have been given I was already aware that in his early career he had drafted utilitarian arguments supporting the use of torture for the purposes of information-gathering from prisoners (see Twining and Twining 1973, and Davies 2012). Moreover, as Gere (2017: 99-132) emphasises, Benthamite social reform was in many aspects more focused on utilising pain in order to discourage 'anti-social' behaviours such as pauperism, vagrancy and promiscuity through institutions such as the workhouse than it was on directly promoting popular pleasure.

observes, the 19th century saw an increasing fascination with dogs among British middle classes, including growing belief in pedigree and specific breed physical and moral characteristics. Greyhounds and spaniels were both regarded refined breeds associated with the aristocracy and sporting establishment. When Magendie was condemned for cruelty in 1825 by MP Richard Martin,³⁰ emphasis was placed on the fact that he had allegedly used “a ladies' spaniel” (in other accounts a greyhound) (Hansard 1825: 1011-1012). The idea that pedigrees and lapdogs were more sensitive than ordinary street mutts, or at least more sociozoologically valued, was even implicit in scientific practice. At the 1875 Royal Commission, commissioner John Eric Erichsen requested confirmation from the senior British physiologist William Sharpey that “The dogs that are used are usually curs and mongrel breeds, and are got at a very cheap price?”, whereby Sharpey responded “Yes; it is a mistake to suppose that physiologists are indifferent to those things” (Report 1876: 26). The belief that both human races and animal breeds hierarchically varied in sensitivity thus emerged together in early 19th century Britain as ideas of class hierarchies in sensitivity combined with beliefs in a great chain of being, producing the notion of a ‘great chain of feeling’ (Bourke 2014).

This idea of a sociozoological scale of sensitivity rising with social refinement and good breeding was coupled with a Whiggish belief in civilisation’s tendency to increase human capacity for sympathy. Asked at the Commission by Chairman Lord Cardwell whether “there is a growth of moral sentiment in the direction of greater carefulness in the infliction of pain?”, Oxford anatomist George Rolleston responded that “The whole [British] race has without any doubt whatever developed in sensitiveness in this direction”, a process he believed “has gone on considerably faster within the last couple of hundred years”. Rolleston further suggested the sensitisation process might be more global, observing that “there is scarcely a country in the world where such a punishment as crucifixion would be endured now; yet the Romans crucified thousands of men at once after the Servile war” (Report 1876: 64-65).

Rolleston’s speculations about a global growth in sympathy associated with the civilising process were not exceptional, indeed found theoretical support in Charles Darwin’s 1871 *Descent of Man*. Darwin suggested sympathy originated from social instincts and was originally in ‘savage’ peoples limited to emotional attachment to members of one’s tribe. Civilisation, by agglomerating tribal groups into larger societies, led to group selection for an expanded social instinct, producing an increasingly abstract and intellectual sense of sympathy. Eventually, civilised peoples became able to control their emotions and extend sympathy to all sensitive beings (Boddice 2016: 29). With Darwin, the natural benevolence thought by Latitudinarians implanted by God in all humankind was transformed into a specific evolutionary achievement of western civilisation, which other human races and societies only approximated in a lesser degree. “[H]umanity to the lower animals” Darwin thought “one of the latest moral acquisitions”, and as “apparently unfelt by savages, except towards their pets” (Darwin 2004: 147).

But, as Boddice (2016: 30-31) highlights, Darwin feared this progressive ascent might be “suddenly broken by a paradoxical degeneration”, as “all the elements of weakness are *preserved* out of sympathy, and the society that has prevailed out of the strength of collaboration has grown up in its own midst the seeds of its degradation”. For civilisation to

³⁰ Architect of the 1822 Cruel and Improper Treatment of Cattle Act, the first nationwide piece of British animal welfare legislation to be passed into law.

survive, Darwin believed a new ‘scientific sympathy’ must emerge, one prepared to sacrifice weakly ‘miserable objects’ to serve the greater good. Whilst having similarities to Benthamite utilitarianism, this Darwinian view of morality was also informed by a self-congratulatory evolutionary ethics whereby Darwin and his followers saw themselves, in recognising and seeking to act upon this need for calculated ‘callousness’ to serve a higher purpose, as instantiating a further moral-psychological evolution crowning the Great Chain of Feeling (Ibid: 137-143). The failure of antivivisectionists to see the greater good done by physiologists was thus reinterpreted as evidencing their psycho-moral inferiority and incapacity to move beyond the immediacy of common compassion and perceive “the more remote consequences of [their] actions” (Darwin 2004: 157).³¹ This perception was reinforced in the eyes of supporters of vivisection by the heavy presence of women, traditionally regarded inferior to men in capacity for moral judgement, among the ranks of antivivisectionism (Boddice 2011a).

Boddice ultimately connects this Darwinian account of sympathy with the emergence of eugenics, coercive public health measures, and of the idea of scientists as a ‘new priesthood’ empowered to preside over national health and well-being. It was also an important source of justifications for vivisection, over and above the objection that animals were sensitive beings.³² Echoes of Darwin’s evolutionary account of sympathy are evident at the 1875 Royal Commission, where George Humphry, Professor of Anatomy at Cambridge, remarked that “Pathological experiments [on animals] I think, become more and more necessary as civilization advances. Civilization is the great engenderer of disease, and unless the healing art is made to advance in proportion, there will be as the result of civilization a distinct degeneration of man, physical and moral” (Report 1876: 32).

What Darwinians justified as necessary callousness³³ was perceived by antivivisectionists as evidencing physiologists’ demoralisation. For MP James Maden Holt, the threat to civilisation came not from preserving the weak but rather from permissive attitudes towards cruelty: “If we accustom the people of this country to hear of, to read of, and to think of cruelty in any form as allowable, the result will be that we shall encourage those savage unfeeling habits which it is the object of all civilized nations to repress” (Report 1876: 303). The doyenne of British antivivisection Frances Power Cobbe further pointed to the uncomfortable irony “that the disciples of Darwin should themselves be the teachers and leaders in a new development of most exquisite cruelty to the brutes whom they believe to share our blood, our intelligence, and our affections” (Murrie 2013: 265). It was this deep disquiet with physiologists’ advocacy of vivisection whilst simultaneously recognising human-animal evolutionary continuity which lay at the heart of Jesse’s warning that vivisectionists would “not... stop with the *animals* in their experiments”. If physiologists were prepared to ignore sympathetic imperatives to experiment on animals, what was to stop them

³¹ Original context: “With increased experience and reason, man perceives the more remote consequences of his actions, and the self-regarding virtues, such as temperance, chastity, &c., which during early times are, as we have before seen, utterly disregarded, come to be highly esteemed or even held sacred”.

³² Vivisection on this account was regarded as justified even if anaesthesia was not used. The insistence on anaesthesia’s use at the 1875 Commission, as discussed in Holmes and Friese 2020, should not obscure the fact that the majority of medical men gathered there believed that the human good done by experimentation outweighed the evil of animal suffering even without anaesthesia, and that the moral obligation to use anaesthesia was as much a matter of protecting the human surgeon from distress and demoralisation as it was of annihilating animal consciousness of pain.

³³ See Boddice 2016: 49-51 for discussion of William Ostler’s 1889 characterisation of the scientific man of feeling as someone sensitive to suffering but nonetheless capable of “a callousness which thinks only of the good to be effected”.

from “propos[ing] to torture to death on the score of utility, idiots, foundlings, paupers, or even criminals?” (Jesse 1875: 125).

Let us recall the Latitudinarian dispute with Hobbes. Hobbes denied political subjecthood to those who could not covenant – animals, ‘natural fools’, the mad and children – arguing they were instead subject to relations of hostility. Latitudinarian divines argued *contra* Hobbes that compassion constituted an innate ethical imperative necessitating these politically disempowered beings be respected as moral patients. The Darwinian argument that scientific sympathy be directed towards the ‘greater good’, even if requiring a calculated callousness towards individual sensitive beings, was rightly read by antivivisectionists as rejecting this ‘common compassion’ (Boddice 2016: 65-71). If sympathy for animals, as sensitive beings without autonomous political rights, was ignored for utility’s sake, what stopped the same being applied to humans lacking political subjecthood? Protection for moral patients, in other words, could not be sustained if it were acceptable for them to be sacrificed for the ‘higher’ ends of moral agents.

7. Constituting the Human-Animal Boundary: Sensitivity, Civilisation and Calculating Pain

Rejection of a general duty to respond to the immediate strains of sympathy, in favour of a directed compassion aimed at defending nation and civilisation, was to an extent already implicit in the pre-existing concept of a ‘great chain of feeling’ that accorded animals and ‘lower’ human races less sensitivity and therefore less priority as recipients of benevolence. Indeed, many humanitarian supporters of ‘civilisation’ thought it a necessary part of progress that wild beasts and indigenous colonised peoples be driven out and extirpated. RSPCA secretary John Colam saw no contradiction between his animal welfare advocacy in Britain and his support for tiger extermination in India (Turner 1980: 128). Darwin, a strong supporter of abolitionism (Desmond and Moore 2009), thought it nevertheless inevitable that “At some future period, not very distant as measured by centuries, the civilised races of man will almost certainly exterminate and replace throughout the world the savage races”, as well as the “anthropomorphous apes”, such that in this future time the “great break in the organic chain between man and his nearest allies” “will intervene between man in a more civilised state... than the Caucasian, and some ape as low as a baboon, instead of as at present between the negro or Australian and the gorilla” (2004: 183-184).

Yet, as Hutton argued in 1875, if civilisation raised some humans above others in sensitivity and value, surely it also raised up beasts exposed to the same civilising conditions. In a context of an ever-greater blurring of the human-animal boundary, why should favoured status for civilised and sensitive be reserved for humankind alone? Hutton here exploited contradictions in the Darwinian narrative of sympathy and civilisation, for if it was hyper-aesthetic sensitivity that distinguished valued civilised citizen from unvalued barbarous savage, then surely the inferred enhanced sensitivity of civilised animal breeds should also be taken into account in the vivisector’s utilitarian calculations. Comments such as Sharpey’s regarding curs and mongrels indicate that some physiologists already did consider such matters. But Hutton went further in maintaining that the impossibility of drawing “fine distinctions” between different animal breeds’ sensitivity rendered it therefore desirable to exempt all members of a species in which select strains or individuals exhibited high sensitivity (Report 1876: xxii). Implicit in this argument was also the proviso that no human, no matter how sociozoologically devalued, should be forcibly subjected to experimentation given that they too belonged to a species exhibiting high sensitivity. Hutton’s suggestion for sensitivity-based species-wide exemptions from can thus be viewed as an attempt to establish

a safety net for all sensitive beings lacking political subjecthood that might otherwise be exposed to hostile treatment on the basis of social utility.

Despite his arguments being rejected by his fellow commissioners and restricted to his minority report, Hutton's recommendations on dogs and cats were included in the first draft of the 1876 parliamentary bill. After sustained protests by scientists and doctors, however, exemptions for these animals were removed and experimentation allowed provided an additional certificate was applied for (French 1975: 112-158). Whilst protests against exempting dogs and cats primarily stressed utilitarian claims about the necessity of their use in physiological research, their de-exemption also constituted an implicit rejection of Hutton's demand that physiologists account for psychosomatic and psychological forms of suffering. Instead, the eventual 1876 Cruelty to Animals Act restricted its requirements on the physiologist to determining whether an experiment was "calculated to give pain", establishing whether experimental pain could be mitigated through anaesthetics or by operating on a more insensitive species, and to justifying the animal's pain and sacrifice in terms of expected benefit to humanity (1876 Act). The 1876 Act thus constituted and formalised an approach to animal welfare that was not only utilitarian and anthropocentric but which moreover left the determination of the calculus of suffering and benefit largely in the hands of scientists. The Darwinian claim to the pre-eminence of scientific sympathy was thus not seriously challenged.

Kirk (2014: 244) argues that the licensing regime instituted by the 1876 Cruelty to Animals Act operated under the presumption that "pain was understood physiologically, that is, as the result of physical (generally surgical) interventions into the animal body". Arguments at the Commission surrounding hyper-aesthesia show that concerns were raised around non-physiological forms of animal pain but were then deliberately marginalised, partly to appease scientists and doctors opposed to exemptions for dogs and cats but also in order to secure the human-animal boundary and the anthropocentric nature of experiment against those such as Hutton who wanted the intimacy and coevolution of human relationships with companion animals to be taken into account.

This marginalisation of intimacy was linked to the marginalisation in the 1876 Act of another aspect of animal sensitivity and welfare, namely pleasure. Experimental animals were assumed to be subject to suffering, which experimentalists were to mitigate through good experimental design and correctly employing anaesthetics and euthanasia. There was, however, no parallel legal duty to make these animals happy nor any implicit notion that "happy animals make good science" (Poole 1997). As Shmueli discusses (2017: 177-190), early inspectors read signs of apparent animal happiness as evidence for the absence of pain and took this as satisfactory, rather than something to be improved on.³⁴ Friese and I have suggested elsewhere (2020) that disregard for the animal 'good life' at the 1875 Commission was not accidental but rather integral to attempts by scientists and moderate humanitarians to construct a working compromise centred around the anaesthetised animal. The idea of animal interest in the pleasure of a future life outside the experiment, beyond the mere removal of pain and its sacrifice, was, we argued, purposely marginalised as complicating efforts to present anaesthesia as a panacea for pain.

³⁴ E.g. "Poore encountered monkeys quite often, and he almost always took their energetic behavior as a sign of wellbeing" (Shmueli 2017: 179).

The 1876 Act thus constituted a particular sociozoological order which strictly bounded human and animal, and restricted compulsory human duties towards animals to concern for physiological sensitivity to pain only. By constituting a utilitarian approach to animal experimentation that continued to empower scientists to determine what constituted ‘utility’, the 1876 Act moreover implicitly endorsed ‘scientific sympathy’ against ‘common compassion’. As Boddice (2016) notes, the same appeals to the ‘greater good’ made by vivisectionists to justify sacrificing animals would also be made by British eugenicists such as Francis Galton and Karl Pearson to advocate segregating and sterilising ‘unfit’ humans. Whilst Darwin had in *Descent* rejected the pessimism of Galton and others regarding the threat of the ‘weak’ swamping the nation due to their promiscuity and the relative infertility of the talented, this was as much due to his thinking eugenic propositions unfeasible due to his rejection of the influence of sports in evolution as it was due to his concern that an excessive callousness might ultimately degrade the noble nature of ruling class ‘sympathetic selectors’ (2004: 159-162). Even Huxley, who in his 1893 ‘Evolution and Ethics’ rejected Social Darwinist calls for the application of ‘survival of the fittest’ to society, chose to envisage civilisation as a garden in which a gardener “pulls up defective and superfluous plants” and on no account treats “the weeds and slugs, and birds and trespassers as he would like to be treated”. Comparing the establishment of a garden to the white settlement of a new colony, Huxley further envisaged “some administrative authority, as far superior in power and intelligence to men, as men are to their cattle” (the closest human equivalent doubtless being a British ruling class scientist), who would proceed in the same fashion as the gardener, stopping the influence of external competition “by thoroughly extirpating and excluding the native rivals, whether men, beasts, or plants” and creating more favourable conditions of existence for colonists to encourage their propagation. Whilst Huxley generally favoured a focus on improving conditions to allow the population as a whole to flourish, in extremis, such as “When the colony reached the limit of possible expansion” and the struggle for existence threatened to be reintroduced, he expected the gardener to “meet this most serious difficulty by systematic extirpation, or exclusion, of the superfluous” (Huxley 1895). Even Darwinians who formally rejected eugenics thus endorsed the sacrifice of the weak where thought necessary for the greater good of civilisation.

The 1876 Act thereby, in rejecting Hutton’s appeal for a safety net for sensitive species in favour of anthropocentric and utilitarian welfare standards for animal experimentation, thus also continued to leave vulnerable those humans rendered animalised by lack of full participation in the qualities attributed by late Victorian society to the abstract ‘Human’. Whilst strictly binding human from animal, the Act also intimated that those failing to meet criteria for social participation as ‘human’, even if sensitive and subject to civilising influences, could be sacrificed in the name of the ‘greater good’. The 1876 Act, whilst formalising limited welfare provisions for laboratory animals, should also therefore be understood as offering encouragement to scientific and medical visions for social control, the elimination of animalised humans and the exploitation of those with ‘least to lose’.³⁵

8. Coda: Complicating Sensitivity in the Wake of the Long Life of the 1876 Act

As established above, the 1876 Cruelty to Animals Act had a long life, remaining law for 110 years, and continues to indirectly influence laboratory animal welfare in the UK through its successor, the Animal (Scientific Procedures) Act. I have suggested that the 1876 Act

³⁵ See Gere’s (2017: 129) somewhat polemical assertion that “utilitarian medicine – from the passing of the Anatomy Act until the human experimentation crisis of the 1970s – tended to exacerbate rather than ameliorate asymmetries of class and power, by singling out for sacrifice those people it deemed to have the least to lose”.

constituted a particular sociozoological scale centred around physiological sensitivity to pain, and that this constitution has had long term ramifications. This constitution has not, however, been wholly inflexible and appeals to sensitivity have played an important role in its modification. The 1876 Act, when in place, was living legislation, its interpretation and enactment being negotiated. Shmueli in her study of the Act's early enforcement has shown how dialogue between scientists and Home Office civil servants over experimental design and animal treatment helped shape experimental practice such that "law and science co-constructed concepts of 'pain' and 'experiment'" (2017: 59). Over time, negotiations between scientists and legislators, as well as activism by meliorist groups like UFAW (the Universities Federation for Animal Welfare, founded in 1926 as ULAWS), did enable aspects of animal pain disregarded in the Act's original design to receive consideration in everyday practice through informal standards and legislative amendments. Kirk (2014) for instance argues that interwar developments in ethology, influenced by Hans Selye's theory of general adaptation syndrome, led to increasing recognition of stress' role in animal suffering, eventually leading scientists to begin including mental anguish in calculations of expected experimental pain, as Dennis Chitty and John Clarke did in 1949 when applying for a license to carry out population density induced social stress experiments on voles.

Other successful utilisations of sensitivity discourses expanding ethical consideration and rights for experimental animals have since followed Chitty and Clarke. Like Anthony in 1875, these discourses often appeal to cognitive sophistication as a marker for sensitivity. For example, in 1993 the common octopus became the first invertebrate to receive protection from painful scientific experimentation under the Home Office's licensing system, with their "complex nervous systems and learning abilities" being cited as evidence that unanaesthetised experimentation was likely unacceptably painful for them (Vines 1993). In 1997, research on great apes was banned in the UK, based in large part on the argument that as our closest evolutionary cousins they doubtless share much the same capacity for mental anguish as ourselves (Balls 2012: 69).³⁶

Scientific research into animal sensitivity and cognition has, however, also increasingly shown that there is no linear relationship between intelligence and capacity to experience pain, complicating efforts to use cognitive capacity as a proxy for sensitivity. Animal intelligence itself is difficult to quantify due to dependence on relative measures. As Peter Godfrey-Smith notes, "When we try to compare one animal's brainpower with another's, we also run into the fact that there is no single scale on which intelligence can be sensibly measured. Different animals are good at different things, as makes sense given the different lives they live" (2017: 50). Arguably much the same holds for animal sensitivity, namely that different animals are sensitive to different things based on the lives they lead. Whilst tests can measure particular aspects of both intelligence and sensitivity, they often favour some species over others not because of greater intelligence or sensitivity but rather because they are *differently* intelligent or sensitive in a manner more tractable for testers. Godfrey-Smith for instance suggests octopus did poorly in early intelligence tests simply because the designs were based on rat and pigeon models and failed to compensate for differences in cephalopod behaviour (Ibid: 50-59).

³⁶ Balls citing Jack Straw (1997): "Great Apes... have never been used under the 1986 Act as laboratory animals. But this has not previously been banned. The Government will not allow their use in the future. This is a matter of morality. The cognitive and behavioural characteristics and qualities of these animals mean it is unethical to treat them as expendable for research".

Regarding sensitivity, the naked mole rat, an experimental organism of increasing recent medical interest due to its longevity and cancer resistance, is a remarkably physiologically *insensitive* mammal, with much-reduced capacity to feel pain or sense temperature (Pennisi 2016). Whilst they have relatively small brains, they are eusocial animals with complex behavioural routines, suggesting their physiological insensitivity is not correlated with unintelligence (Schulze-Makuch 2019). Moreover, the colonial nature of normal mole rat life contributes to demanding welfare requirements (Rozenbaum 2020) and likely shapes mole rat psychology to be intolerant of isolation. By contrast, the Syrian hamster, another rodent used in medical research, has no depressed sensitivity to pain but is largely solitary in wild and tolerant of social isolation in the laboratory (Ross et al 2017). These two species, although members of the same mammalian family, therefore have very different welfare needs that are difficult, if we include psychological and psychosomatic sources of suffering, to treat linearly in terms of a greater or lesser sensitivity.

The absence of a coherent and unitary ‘great scale of feeling’ complicates attempts to apply generalist legislation such as the 1876 Act and its 1986 successor ASPA to the animal world at large. That such legislation is still commonly interpreted in terms of hierarchies of sensitivity is evident in the widespread assumption that the ‘R’ of ‘Replacement’ can be partly served by substituting sensitive species with animals “lower on the phylogenetic scale” (Tannenbaum & Bennett 2015: 127).³⁷ This ‘relative replacement’ (Russell & Burch 1959) has commonly entailed employing invertebrates and ‘primitive’ vertebrates such as fish and frogs instead of mammals.³⁸ Claims that particular classes of ‘lower animal’ are less sensitive have however in many cases been shown to be based on problematic assumptions. The argument, for instance, that fish do not feel pain because they lack a neocortex implicitly presumes the fish brain to be organised like a mammalian brain but to be more evolutionarily ‘primitive’. Vetesse, Franks and Jacquet (2020) trace this argument to the Apartheid South African ichthyologist J.L.B. Smith, whose hierarchical assumptions about vertebrate

³⁷ See also Preece (2007: 30-35) for discussion of the continuing prevalence of a language of ‘lower’ and ‘higher’ animals and of hierarchical scale among evolutionists and geneticists.

³⁸ A preference for using ‘lower animals’ on the basis of assumed lesser sensitivity was already apparent as far back as 1875, as seen, for instance, in Joseph Lister’s assertion that one reason the frog was so widely used in physiology was because “of its being not supposed to suffer materially” (Report 1876: 217). Lister echoed Anthony in believing that “The lower we go in the scale of animal organisation, the lower is the sensibility” (Ibid: 216). Lister’s views were supported by, among others, Galway professor John Cleland, who maintained batrachian mentality to be “a twilight thing compared with our consciousness”, citing the fact that “The cerebral hemispheres in the frog are very slightly developed” (Ibid: 231-232). Amateur physiologist George Henry Lewes went as far as to opine that he did not personally believe that frogs suffered pain at all (Ibid: 313). UCL’s Edward Schäfer, whilst stating that he took every care to humanely treat ‘higher animals’, admitted that frogs in his laboratory were not anaesthetised when vivisected, partly due to technical difficulties but also due to lesser concern that they suffered harm (Ibid: 189-191). Whilst Schäfer did “very often” employ pithing (inserting a needle into the brain or spinal column to destroy the animal’s central nervous system), he advised that it was used “chiefly in those experiments in which it facilitates the object of the experiment”, i.e. for instrumental reasons such as immobilising the animal, and not from a motive of humanity. When asked to clarify whether there were “a great number of experiments” where neither pithing nor anaesthetics were used that “supposing a frog to be a sensitive animal, must cause a vast deal of pain”, Schäfer responded “There is no doubt about it” (Ibid: 189). It is clear from Schäfer’s previous remarks that he did *not* regard frogs as ‘sensitive animals’, at least not in the way mammals and ‘higher animals’ were, and for this reason did not regard these experiments as problematic. Such claims about frog pain were, however, contested by other witnesses at the Commission, with John Simon asserting that he had “no doubt as to the frog’s full susceptibility of pain” and “taking all physiologists together, there is a good deal of hurting of frogs” (Ibid: 76). The veterinarian William Pritchard even went as far to affirm that frogs were likely “as sensitive as horses”, at least based on the similar irritability of their skin when enduring parasitism (Ibid: 38), although this claim was rubbished by Lister, who maintained that “It would be very difficult to prove that frogs *suffer* from parasites” (Ibid: 217).

sensitivity and cerebral evolution were paralleled by similar assumptions about cognitive and sensory differences between ‘civilised’ and ‘primitive’ human races. Despite being made nearly a century after the 1875 Commission, Smith’s arguments about animal and human sensitivity in essence differed little in their sociozoological preconceptions to those made by Huxley in 1875.

Despite strong emerging experimental evidence of pain-avoiding fish behaviour³⁹ and increasing recognition of variation in neurological organisation among different classes of intelligent vertebrates,⁴⁰ scepticism about fish pain engendered by Smithian arguments continues to be prevalent in the British life sciences. One knock-on effect, as discussed by Message and Greenhough (2020), has been to hamper efforts to enforce the 3Rs in UK laboratory aquariums. There is thus a real potential for hierarchical thinking grounded in linear evolutionary narratives to harm some animals through encouraging a likely underestimation of their sensitivity.⁴¹ Other sociozoological influences on perceptions of animal sensitivity or need for protection have less credibility within the scientific community but are nevertheless still sources of concern for animal welfare advocates. Pru Hobson-West and Ashley Davies (2018) term this imaginary related to the believed influence of popular prejudice on animal welfare legislation and practices “societal sentience”. They cite as an example “the relative lack of cultural concern over the use of pigs in biomedical research”, which their interviewees⁴² attribute to the fact the pig is seen as “a farm animal” that is eaten, rather than as a companion animal like dogs and cats. A lack of concern about rats and mice is likewise attributed to their sociozoological status as “dirty vermin” (Ibid: 684). These concerns about the influence of ‘societal sentience’ find support in Karen Rader’s observation that some biomedical scientists working with rodents historically sought to encourage public prejudices in their efforts to counter antivivisectionist activities.⁴³ ‘Societal sentience’ thus might for some species give more room for ‘cynical scientists’ (see Holmes and Friese in press) to operate where a better empirically grounded welfare policy would restrict them.

Sensitivity thus has limits in operating as an organising principle for an interspecies scale of experimental animal welfare needs. At the very least, any such scale would ideally need to be multi-dimensional and non-linear.⁴⁴ Where scientists are unable to clearly determine extent of sensitivity, there needs to be recognition, as Arluke and Sanders emphasise, of the risks of influence by social prejudices for or against particular species. Such a scale should also not merely focus on calculating pain but also on producing pleasure. Recent efforts in Britain,

³⁹ Godfrey-Smith (2017: 94) cites, for example, experiments with zebrafish where fish injected with a chemical believed to induce pain will prefer otherwise less desirable environments if (and only if) a painkiller is dissolved in the water.

⁴⁰ Birds, due to the weight demands of flight, have for example evolved brains that are comparatively small by mammal standards but which contain a much greater density of neurons and a generally higher concentration of neurons in the telencephalon. It is believed that this allows their brains to greatly outperform in many functions those of similar size in mammals (Olkowicz et al 2016).

⁴¹ The exclusion of octopus and other cephalopods from the 1876 Act on the basis of being invertebrates, leaving them without protections against painful experimentation, offers another historical example of the harm that hierarchical assumptions about sensitivity, in this case 19th century prejudices against the possibility of invertebrate intelligence, can be suggested to have contributed to.

⁴² The ten interviewees were Named Veterinary Surgeons (NVSS) and Named Animal Care and Welfare Officers (NACWOs) working for a UK commercial company’s laboratories.

⁴³ See Rader (2004: 150-152) for discussion of Clarence Little’s 1937 argument that “biomedical researchers should exploit ‘the age old enmity of women and the Muridae’” in order to defeat challenges to mouse research by antivivisectionists. My thanks to Carrie Friese for pointing me to this reference.

⁴⁴ On the question of whether there might be a ‘common currency’ underlying different species’ mental states that might allow for such an interspecies scale of animal welfare, see Heather Browning (2019).

Europe and elsewhere to push back against welfare-suboptimal laboratory practices and standards and establish a ‘culture of care’ have partly been motivated by recognition that mere absence of physiological pain and overt mental stress is inadequate for good animal quality of life (Greenhough and Roe 2017; Davies et al 2018). Calls for the addition of a fourth ‘R’, ‘Rehabilitation’, likewise recognise that most higher animals likely have an implicit interest in future life and that ‘retirement’, if likely largely pain-free and pleasurable, is preferable to euthanasia (Pereira and Tettamanti 2005).⁴⁵ Nevertheless, the long shadow of the 1876 Act’s one-sided focus on ‘calculating pain’ continues to shape the treatment of laboratory animal sensitivity in Britain and beyond.

⁴⁵ Rehabilitation campaigns have primarily focused on human near-relatives (e.g. great apes) and traditional companion animals (e.g. cats, dogs). Although rodents make up the vast majority of UK lab mammals and are commonly kept as pets (many mouse lineages indeed have origins in fancy stock; see Rader 2004: 32-34), they are, for a number of reasons, relatively unpopular targets for rehoming (see Skidmore and Roe 2020).

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