Misfits, Power, and History: Rethinking Ability through an Animal Lens

'Are you blind as a bat? If so, you have remarkably good eyesight.' So began an article in British local newspaper, the *Sheffield Independent* in 1938, reporting on a series of experiments on bats undertaken by the naturalist Arthur Whittaker.[1] The particulars of the experiments themselves are perhaps not important here; instead, the premise is significant in its playful evocation of a stereotype of bat ability – or lack thereof – and its indication that reappraising the bat's abilities could reveal much about the world. Historically, the apparent blindness of the bat is not the only example of such evaluations of animal abilities. The mole, for example, remains symbolic of visual impairment.[2] Conversely, some creatures that live in darkness ('dark-dwellers') with large eyes, such as owls – enabling them to see in the gloom – were historically imagined as having super-abilities and often associated with the other-worldly.[3] At their core, these images of animals reflect value judgements about what they *can and cannot do*.[4] Reconceptualising these kinds of ideas about 'ability', as they manifested across diverse contexts, is crucial for understanding how people understood themselves and other beings across time and space. Such an approach to the history of ability matters. It points to the urgency of interrogating the roots of a seemingly everyday idea – ability – one that appears commonplace and apparently unproblematic but that has material consequences for all living beings, human and animal, across a wide range of environments. As is suggested by the question 'are you as blind as a bat?', these cultural assumptions about ability have often been applied to people. Given this broad context, historians need to do more to engage with ability as a powerful analytical lens.

In this article we construct a history of ability by focusing on the specific case study of dark-dwelling animals. As the example of the bat makes clear, such creatures were frequently the subject of assumptions and judgements about their abilities. Dark places have historically

[1] 'Are you blind as a bat?', *Sheffield Independent* (16 March 1938), 4.
[2] For instance, the British optician Vision Express currently uses the bespectacled character Marvin the Mole in television adverts. A blind mole is also featured in the US adult animation, *Happy Tree Friends* (2000-2016). For more on moles and popular culture see: Steve Gronert- Ellerhoff, *Mole* (London: Reaktion, 2020).
[3] Nina Edwards, *Darkness: A Cultural History* (London: Reaktion, 2018), 235-54.
[4] Ideas about animals – and their physical capacities to change the course of history – are commonplace and have been the subject of a field that has been burgeoning over the past several decades. See *History and Theory*, 54, Theme Issue: 'Does History Need Animals' (2013); Ewa Domańska, 'Animal History', *History & Theory*, 56 (2017), 267-87; Erica Fudge, 'A Left-Handed Blow: Writing the History of Animals', in Nigel Rothfels (ed.), *Representing Animals* (Bloomington: Indiana University Press, 2002), 1-18; Emily O'Gorman and Andrea Gaynor, 'More-Than-Human Histories', *Environmental History*, 25 (2020), 711-35; Harriet Ritvo, *The Animal Estate: The English and Other Animals in the Victorian Age* (Cambridge MA: Harvard University Press, 1987).

been imagined as extreme environments, and as home to equally strange beings.[5] Because of this, the dark was a particularly generative place for naturalists thinking about animal bodies and behaviours. We argue that discourse relating to dark-dwellers – from bats and hedgehogs to deep-sea creatures – reveals that ability, in the animal context, relates to several connected ideas and phenomena. Not least, these include ideas around specialisation, adaptation and adaptability, the concentrated interrogation of 'special' sensory organs and neurological pathways, and the idealised coherence between a body and its wider environment. We also show that the idea of ability became increasingly inseparable from notions of vulnerability, resilience, and care especially in the context of twentieth- and twenty-first century environmental change. The concept of ability, then, was a shifting constellation of many different ideas. Such case studies reveal how big ideas like ability are far from homogenous in character but instead are complex, multi-layered, and of their time.

Interest in animal abilities has a long and significant history. People have looked to the natural world, and often the behaviours of animals, seeking signs, signals, and omens, to find out about their own futures.[6] More recently, animals with extraordinary 'mathematical abilities' were celebrated, from Toby the Sapient Pig in the early nineteenth-century, to Clever Hans the horse a century later.[7] Animals in war were – and still are – also often valued for their ability to perform a range of roles on and beyond the battlefield, and their efforts have been recognised through memorialisation.[8]

Sensory perception has frequently been central to this wider discourse about animal abilities. This is particularly true in relation to animals inhabiting dark environments, as people attempted to work out how such creatures experienced the world in the apparent absence of vision. But more than that, the fact that people have found it difficult to access the darkness

[5] Studies of dark environments have diversified in recent years. Tim Edensor, 'Sensing and Perceiving with Light and Dark', *The Senses and Society*, 10 (2015), 129-137; Andrew Flack, 'Dark Trails: Animal Histories beyond the Light of Day', *Environmental History*, 27, (2022), 215-241; Kevin Gaston, 'Nighttime Ecology: The 'Nocturnal Problem' Revisited,' *American Naturalist*, 193 (2019), 481–502; Sara Pritchard 'The Trouble with Darkness: NASA's Suomi Satellite Images of Earth at Night', *Environmental History*, *22* (2017), 312–30.

[6] A. Roger Ekirch, *At Day's End: A History of Nighttime* (London: Phoenix, 2005), 9; Keith Thomas, *Man and the Natural World* (Harmondsworth: Penguin, 1983), 92-142.

[7] Helen Cowie, *Exhibiting Animals in Nineteenth-Century Britain: Empathy, Education, Entertainment* (Basingstoke: Palgrave Macmillan, 2014), 64; Erica Fudge, *Animal* (London: Reaktion, 2002), 113-58; Andrew Flack, *The Wild Within: Histories of a Landmark British Zoo* (Charlottesville and London: University of Virginia Press, 2018), 61.

[8] Ryan Hediger, *Animals and War: Studies of Europe and North America* (Leiden: Brill, 2012); Chris Pearson, '"Four-legged *Poilus*": French Army Dogs, Emotional Practices and the Creation of Militarized Human-Dog Bonds, 1871-1918', *Journal of Social History*, 52 (2019), 731-760; Gervase Phillips, 'Animals and War', in Hilda Kean and Philip Howell (eds.), *The Routledge Companion to Animal-Human History* (London: Routledge, 2018), 422-445.

themselves (because the human visual system is typically adapted to detailed vision in daylight conditions) and to observe animal behaviour has generated diverse and imaginative appraisals of what these creatures can and cannot do.[9]

Analysis of the idea of ability requires a certain shift of focus because it shares conceptual space with the more commonly encountered concept of disability. We need to consider both if we are to understand either. Indeed, Critical Disability Studies scholars Dan Goodley and Fiona Kumari Campbell make precisely this point.[10] Disability is also central to history. As Susan Burch and Michael Rembis argue, it is both a common experience (the largest planetary minority) and a vast constellation of meanings and manifestations across the contexts of time and place.[11] Consequently, it is unsurprising that disability historians have been exploring the political, social and cultural dimensions of disablement and embodied disabled experiences for several decades now.[12] Daniel Blackie and Alexia Moncrieff recently illustrated the emergent expansiveness and intellectual vibrancy of this field in the nearly two decades since Catherine Kudlick's call for historians to actively include disability – what she provocatively terms 'another other' – in their research and writings.[13] Such evolutions in the

[9] The significance of the senses has fairly recently received historical attention. Scholars of the senses and society have evidence the significance of vision, not least in Western cultures. Constance Classen, *The Book of Touch* (Oxford: Berg, 2005); Alain Corbin, *The Foul and the Fragrant: Odor and the French Social Imagination* (Leamington Spa: Berg, 1986); Tim Edensor, 'The Social Life of the Senses: Ordering and Disordering the Modern Sensorium,' in David Howes (ed.) *A Cultural History of the Senses in the Modern Age* (London: Bloomsbury, 2014); James Mansell, *The Age of Noise in Britain*: *Hearing Modernity* (Urbana: University of Illinois Press, 2017); Mark Smith, *Sensing the Past: Seeing, Hearing, Smelling, Tasting and Touching in History* (Berkeley: University of California Press, 2007); and *A Sensory History Manifesto* (University Park, PA: The Pennsylvania State University Press, 2021).

[10] On Dis/ability see Dan Goodley, *Dis/ability Studies* (London: Routledge, 2014) and 'The Dis/ability Complex', *Journal of Diversity and Gender Studies*, 5 (2018), 5-22; Fiona Kumari Campbell, *Contours of Ableism: Territories, Objects, Disability and Desire* (London: Palgrave Macmillan, 2009).

[11] Susan Burch and Michael Rembis, 'Re-membering the past: Reflections on Disability Histories', in *Disability Histories* (Urbana: University of Illinois Press, 2014), 1.

[12] Histories of disability are now many and varied. It is impossible to cite anywhere near all of them. For a flavour of this diversity, see Daniel Blackie and David M. Turner, *Disability in the Industrial Revolution* (Manchester: Manchester University Press, 2018); Dea H. Boster, *African American Slavery and Disability: Bodies, Property and Power in the Antebellum South, 1800-1860* (New York: Routledge, 2013); Doris Zames Fleischer and Frieda Zames, *The Disability Rights Movement: From Charity to Confrontation* (Philadelphia: Temple University Press, 2011); Paul Longmore and Lauri Umansky, *The New Disability History* (New York: NYU Press, 2001); Kim. E. Neilson, *A Disability History of the United States* (Boston: Beacon Press, 2013); Jasmine Wood, "Lashings of Grog and Girls: masculinity and sexuality in the rehabilitation of facially disfigured servicemen in the Second World War', *War & Society*, 4 (2021), 296-314.

[13] Daniel Blackie and Alexia Moncrieff, 'State of the Field: Disability History', *History*, 107 (2022), 789-811; Catherine Kudlick, 'Why we need another "other"', *AHR*, 108 (2003), 763-793. It is important to note that Kudlick's provocation was not only aimed at the discipline of history itself. Additionally, she called attention to the marginalization of disability as a contemporary issue and meaningful identity within universities and the various equality, diversity, and inclusion agendas more broadly.

field matter. They evidence not only the myriad ways in which disability has been imagined in the past, but also the ways in which disability was experienced in different times and places.

Interrogation of disability has often been concerned with 'deficit', or 'lack'. Because of this, concerted critique of disability as a phenomenon led to a rejection of the so-called 'medical model' where physical difference was perceived as emerging directly from the 'imperfect', even 'deviant' body. Reality is a potent matrix of material phenomena and social and cultural influences and, indeed, the wider field of Disability Studies, and its offshoot Critical Disability Studies (CDS), recognizes this complexity.[14] Language matters here, too. The focus on the 'dis' of 'disability' might encourage ableist historical examinations that are overly concerned with absence, deficiency, and oppression.[15]

There has been a recent call for historians to consider the historical roots of ability, in what has been termed 'Critical Ability History'.[16] However, as of yet this call has not been answered. We think that it offers a potentially compelling means of building a history that cuts across diverse contexts. By constructing a critical ability history via the specific case study of dark-dwelling animals, we illustrate what might be possible. This demonstrates an inclusive conceptualisation of a deep-rooted cultural phenomenon, and a category of analysis that requires historical interrogation in its own right.

Ability, as related to animals and the wider natural world, provides an important exemplar, illustrating the substantial potential for thinking more deeply and more expansively about the history of this concept. As feminist critical disability theorist Margrit Shildrick argues, CDS permits deeper understandings of *all* living beings, not just humans.[17] Scholars, most prominently Sunaura Taylor, have already begun the work of exploring the connections between studies of human-animal relations and disability studies.[18] There are potent

[14] An array of key concepts have been employed, ranging from the identification and exploration of disabled peoples' historical agency to an allied recognition that disability is not only a cultural construct but also a thoroughly lived experience. See Lennard J. Davis (ed.), *The Disability Studies Reader*, 5th Edition (New York: Routledge, 2017); Dan Goodley, *Disability Studies: An Interdisciplinary Introduction*, 2nd Edition (Los Angeles: SAGE, 2017).
[15] On ableism, see Campbell, *Contours of Ableism;* Robert McRuer, 'Compulsory Able-bodiedness and Queer/Disabled Existence', in Rosemarie Garland-Thomson (ed.) *Disability Studies: Enabling the Humanities* (New York: MLA Press, 2002), 88-99, and Fiona Kumari Campbell 'Precision Ableism: A *studies in ableism* approach to developing histories of disability and abledment', *Rethinking History*, 23 (2019), 138-56.
[16] The emergence and contours of 'critical ability history' is the subject of a special issue of *Rethinking History*: *Rethinking History: The Journal of Theory and Practice*, 23 (2019).
[17] Margrit Shildrick, 'Critical Disability Studies: Rethinking the Conventions for the Age of Postmodernity', in Nick Watson, Alan Roulstone and Carol Thomas (eds.), *Routledge Handbook of Disability Studies* (London: Routledge, 2020), 32.
[18] Sunaura Taylor, *Beasts of Burden: Animal and Disability Liberation* (New York: The New Press, 2016).

contemporary connections between the experiences of people with disabilities and animals in a world that is designed by and for the dominant group; normative, 'able', human beings. There are, of course, profound problems – historical and contemporary – at the heart of the comparison between people and animals, which tend to revolve around the assumption that animality is *less-than*-human. Historically, the status of 'sub-human' – from the experiences of enslaved people in the Americas to those who were persecuted during the Holocaust – has provided a logic, however flawed, to justify marginalisation and oppression.[19] Contemporary scholarship at the intersection of human-animal relations and disability studies recognises this history and tends to be politically activist work that implicitly or explicitly seeks disability liberation by building kinship with the natural world.[20]

This important work is generally concerned with the present. Instead, our research explores how historical ideas about ability *run into* the present. To neglect these historical processes risks the assumption that the apparent connections between animals and disabled people are ahistorical. The lens of ability – focusing on what people thought animals could and should do across a broad span of time – offers generative opportunities across both disability history and animal history. Animal histories have not yet considered animals as mirrors of ideas around normalcy beyond an interrogation of 'freakery' in eighteenth- and nineteenth-century contexts.[21] Doing so offers much deeper insights into what people thought animals were and about their perceived place in the world. Disability history, on the other hand, may benefit from a deeper exploration of the idea of ability as it manifested beyond the human context. After all, humans and animals often occupied the same imaginative spaces across modern scientific and cultural contexts. A history of ability through an animal lens broadens historical appreciation of the roots and manifestations of the concept itself. More widely, it encourages the probing of big, apparently mundane, ideas – such as ability – that are integral to life on earth. So often, such concepts remain underexplored, their meanings taken for granted.

---

[19] See, for example, Erica Fudge, *Animal*, and Tim Cole "Nature was Helping us': Forests, Trees, and Environmental Histories of the Holocaust', *Environmental History*, 19 (2014), 665-86.

[20] Anthony Nocella et al, *Earth, Animal and Disability Liberation: The Rise of the Eco-Ability Movement* (Bern: Peter Lang US, 2012); Kelly Oliver, 'Service Dogs: Between Animal Studies and Disability Studies', *philoSOPHIA*, 6 (2016), 241-258; Sue Walsh, 'The Recuperated Materiality of Disability and Animal Studies', in Karín Lesnik-Oberstein (ed.) *Rethinking Disability Theory and Practice* (Basingstoke: Palgrave Macmillan, 2015), 20-36; Cynthia Willett, *Interspecies Ethics* (New York: Colombia University Press, 2014); Elizabeth A. Wheeler, 'Moving Together Side by Side: Human-Animal Comparisons in Picture Books', in Sarah Jaquette Ray and Jay Sibara (eds.), *Disability Studies and the Environmental Humanities: Towards an Eco-Crip Theory* (Lincoln: University of Nebraska Press, 2017), 594-622.

[21] Harriet Ritvo, 'Out of Bounds', *The Platypus and the Mermaid* (Cambridge, MA: Harvard University Press, 1997), 131-87.

We uncover this history by predominantly focussing on the published writings of naturalists and life scientists, as well as more popular scientific outputs. These writings capture emergent understandings of dark-dwelling animal bodies. They are drawn from across the post-enlightenment period in a European and North American context, with a specific focus on the nineteenth and twentieth centuries, as this is when cultures of natural history were cemented.[22] We read these works – on a diverse array of dark-dwellers – to identify moments where value-judgements were made about what an animal body should, could, and could not do, in relation to varying environmental and cultural contexts. In most cases, these judgements are enshrined within a white male worldview. It is essential to consider the dominant worldview in relation to the construction of ability, as the apparent objectivity, in this case, offered by science and scientists, held real authority.[23] It was considered that this way of thinking, governed by such scientific figures, reflected the way the world and its dark-adapted animal inhabitants *really was*.

We begin in the eighteenth and nineteenth centuries by examining the ways in which diverse understandings of ability emerged from several places: not only directly from the body and the senses, but also from the perceived relationship between the animal body and the wider environment. Then we move into the twentieth century, to look in particular at contexts relating to emergent understandings of environmental change, to show how the idea of ability transformed in relation to social and political shifts, and within a planetary environmental context.

Abilities, Bodies, Environments

In the post-Enlightenment period, naturalists increasingly went out into an apparently ever-expanding world to collect, catalogue, and attempt to understand the works of nature in all their diverse forms.[24] Many focused their gaze on animal life, often asking questions about the ways in which creatures experienced the world. While the naturalists we engage with here initially do not use the term 'ability', we can nevertheless perceive the conceptual structures underpinning the idea. The notion of ability is an idea that has manifested across diverse

[22] John MacKenzie, *The Empire of Nature: Hunting, Conservation and British Imperialism* (Manchester: Manchester University Press, 1988); Ritvo, *The Platypus and the Mermaid.*
[23] See, for example, Lorraine Daston, *Objectivity* (New York: Zone Books, 2010).
[24] Mitchell Ash, 'History of Science' in Mieke Roscher, André Krebber and Brett Mizelle (eds), *Handbook of Historical Animal Studies* (Berlin: De Gruyter Oldenbourg, 2021), 259-74; Nancy Jacobs, *Birders of Africa: History of a Network* (London: Yale University Press, 2016); Stephen Asma, *Stuffed Animals and Pickled Heads: The Culture and Evolution of Natural History Museums* (Oxford: OUP, 2001); Carla Yanni, *Nature's Museums: Victorian Science and the Architecture of Display* (New York: Princeton Architectural Press, 2005).

contexts, and one which changed over time, but at its core it relates to a perceived capacity of someone or something to perform a function, to be 'capable', to possess a power or proficiency.[25]

Before the expansion of scientific cultures and the professionalisation of natural history, in the nineteenth century, appraisals of animal ability were constrained by a partial capacity to observe dark-dwelling animals in their natural environments. This reflected the difficulty observers encountered in seeing what was happening in the dark.[26] For example, Pliny the Elder's interest in the 'ability' of the hedgehog hinged on their supposed capacity to carry apples on their spiny backs, which reflected a fundamental misreading of hedgehog behaviour.[27] Importantly, myths such as these (including those relating to the suckling of cattle by hedgehogs and the defensive deployment of urine) continued to feature in naturalists' texts right into the early nineteenth century, reflecting an ongoing struggle accessing nocturnal worlds.[28] The echoes of earlier understandings of animals continued to be heard well into the modern period. Similarly, still around the end of the eighteenth century, bats were frequently judged as 'imperfectly' designed by God. Their chaotic flight patterns were misread as evidence of a body that was lacking. The French naturalist Georges Buffon noted in the mid-eighteenth century that bat flight was 'bungling and imperfect', while British naturalist Thomas Pennant wrote in 1776 that bats moved in ways which were 'uncertain and jerking' and questioned whether such movement could even be called flight.[29]

Nevertheless, the later eighteenth century marked a point when some new conceptualisations of ability – the connections between bodies and behaviours – began to emerge. Naturalists paid increasing attention to sensory organs and associated sensory capacities. This reflected several impulses. The first arose in the context of wider and quite diverse efforts to classify and categorise, to understand the position of all natural phenomena in relation to each other. Consideration of these animal bodies through the lens of Linnean taxonomy was one way in which naturalists sought to understand, and solidify in the wider scientific schema, sensory

[25] Goodley, *Dis/Ability Studies*.
[26] Flack, 'Dark Trails', 222-29.
[27] H. Rackham, *Pliny: Natural History*, Volume 3 (Cambridge, MA: Harvard University Press, 1938), 95.
[28] Thomas Bell, *A History of British Quadrupeds: Including the Cetacea* (London: Samuel Bentley, 1837), 8,77-80; Georges Buffon, *Natural History, General and Particular, by the Count de Buffon*, third edition, Vol. IV (London: A. Strahan and T. Cadell, 1791), 302.
[29] Buffon, *Natural History*, 319; T. Pennant, *British Zoology*, fourth edition (Warrington: Benjamin White, 1776), 149.

abilities.[30] Established taxonomies meant that there was, in effect, a standardised and well-known set of animal bodies whose anatomies and morphologies were already considered to be understood, such as the famous example of the Galapagos finches. But there were those – like the platypus – whose bodies prompted questions, in particular regarding where they fitted in relation to this already established sequence.[31] This played out in the context of the growing acceptability of Darwinian ideas of evolution, natural selection, and common ancestry from the second half of the nineteenth century. This wider taxonomic culture explains why, in natural history literature relating to the animal world at large, dark-dwellers prompted persistent questions about their place in relation to other animals, and regarding their role in the evolutionary story.

While the vexed question of whether bats were avian or mammalian was largely settled by the nineteenth century, there were other dark-dwelling species whose taxonomic and evolutionary positions were less clear.[32] Blind cave fish, for example, discovered by Western science in the 1840s in caverns beneath the Appalachian mountains, puzzled naturalists for much of the ensuing century.[33] Precisely how and when they came to be eyeless, as well as their relationship to other Appalachian fish – those that did not inhabit the cavernous depths – prompted much debate.[34] Furthermore, writing about the sea anemones of the oceanic depths in the 1880s, the British naturalist and polymath John Lubbock described the 'problematical' nature of even identifying their sensory organs.[35] It was sometimes difficult to comprehend what an organ looked like – in this case, within a jelloid creature, inhabiting the difficult to reach depths of

[30] Andrew Wells, 'History of Animal Collections/ Animal Taxonomy' in Roscher, Krebber and Mizelle (eds), *Handbook of Historical Animal Studies*, 603-18; Arthur MacGregor, *Curiosity and Enlightenment: Collectors and Collections from the Sixteenth to the Nineteeth Century* (New Haven, CT: Yale University Press, 2007); Samuel Alberti (ed.), *The Afterlives of Animals: A Museum Menagerie* (Charlottesville, VA: University of Virginia Press, 2011). For a general consideration of animal sensoria, see S. Connor, 'The Menagerie of the Senses', *The Senses and Society*, 1 (2006), 9-26 and Ed Yong, *An Immense World: How Animal Senses Reveal the Hidden Realms Around Us* (London: Bodley Head, 2022).

[31] Animal historian Harriet Ritvo's history of classificatory systems, *The Platypus and the Mermaid* (1997) illustrates various efforts to logically catalogue animal life, making room for the apparently marginal and the fantastic: Ritvo, *The Platypus and the Mermaid.*

[32] Bell, British Quadrupeds, 2-9. For more on bats in general, see: Tessa Laird, *Bat* (London: Reaktion, 2018).

[33] Andrew Flack, 'Dark Degenerations: Life, Light and Transformation Beneath the Earth, 1840-c.1900', *ISIS* 113 (2022), 331-351. It is a reasonable assumption that these fish (and the wider fauna of the Appalachian subterranean) were already known to Indigenous communities, who frequented cave systems in the area for several thousand years prior to the arrival of white Europeans.

[34] 'Letters to George Boulenger from Carl H. Eigenmann, 1888–1899', Natural History Museum Archives (DF ZOO/235/1/1/1/225); Alpheus Spring Packard, Jr.and Frederic Ward Putnam,,*The Mammoth Cave and Its Inhabitants, or Descriptions of the Fishes, Insects and Crustaceans Found in the Cave* (Salem, Mass., 1872); Frederic Ward Putnam,"The Blind Fishes of the Mammoth Cave and Their Allies,"*American Naturalist,* 1872, 6:27–29.

[35] John Lubbock, 'On Problematical Organs of Sense' in *On the Senses, Instincts, and Intelligence of Animals* (London: Kegan Paul, Trench & CO.,1888), 182-192.

the ocean – let alone how such an organ operated and sensed the world. Such creatures did not fit within the broader expectations of the sensing body held at that time. This related both to the dominance of the Aristotelian model of the five classical senses, and a general focus on more familiar creatures (such as dogs) as experimental subjects.[36] Lubbock went on to note: 'how different the world may – I was going to say must – appear to other animals from what it does to us.'[37] Whilst there was an acceptance that there were diverse bodies and experiences in the natural world, some were perceived as much harder to grapple with than others.

Engagement with the idea of ability in the animal context consequently manifested in an increasing fascination with the appearance of sensory organs over the course of the nineteenth century. The history of both disability and of animals is often dominated by an intensive mode of looking – a gaze, or 'politics of staring', according to feminist disability theorist Rosemarie Garland-Thompson – sometimes scientific, sometimes spectacular, and in this case both.[38] This was essentially a culture of freakery which transcended human and nonhuman contexts.

An example is the star-nosed mole, a creature that inhabits the swamplands of North America, and whose tactile snout – described in 1832 by the French naturalist and academic Constantine Rafinesque as a 'very singular mole'– has 22 mobile projections which are used for feeling for prey in dark, often-submerged, tunnels, rather than for smelling. [39] As an organ, it astounded naturalists across our period of study, and was the focus of intensive investigation. The Cornell mammologist William Hamilton, writing almost a century after Rafinesque, proclaimed that the mole 'can never be mistaken' for another mole species. This is because it is 'one of the most peculiar mammals in a land filled with interesting forms.' [40] Much of this interest in the marginal and the peculiar was rooted in an increased attention to 'norms' and what it meant to be 'normal'. According to Disability Studies scholar Lennard Davis, interest in the idea of normalcy intensified between around 1840 and 1860, as a means of measuring

[36] Smith, *A Sensory History Manifesto.* On canine experimentation see: C. Pearson, 'Thinking', *Dogopolis: How Dogs and Humans made Modern New York, London, and Paris* (London: Chicago University Press, 2021) 115-148.
[37] Lubbock, *On the Senses, Instincts, and Intelligence of Animals*, 191-2.
[38] Rosemarie Garland-Thomson, 'The Politics of Staring: Visual Rhetorics of Disability in Popular Photography' in Sharon L. Snyder et al (eds). *Disability Studies*: *Enabling the Humanities* (New York: Modern Language Association, 2002), 56-75. Also see Kenny Fries (ed.) *Staring Back: The Disability Experience from the Inside Out* (New York: Penguin, 1997). On animals in this context see: Flack, *The Wild Within*; Ritvo, *Platypus and the Mermaid*, 131-87.
[39] Constantine Rafinesque, 'Zoology', *Atlantic Journal and Friend of Knowledge* (Spring, 1832), 61.
[40] William Hamilton, 'Habits of the Star-Nosed Mole, *Condylura Cristata', Journal of Mammalogy*, 12 (1931), 347, 354.

difference.[41] Indeed, close reading of natural history texts illustrates that a sense of what was ordinary and what was extraordinary was clear well before this time but became more pronounced as a quantifiable phenomenon around the middle of the nineteenth century.

An important element of this focus on sensory organs, was a growing desire to understand precisely how they functioned as adaptations. This meant that naturalists increasingly manipulated, tested, and disassembled animal bodies. This engagement with physical bodies reflects a broader scientific conceptualisation of bodily difference, which also manifested at around the same time in the pathologisation of people with diverse bodies in a medical context.[42] We can identify an implicit assessment of sensory ability in the often-violent experiments naturalists conducted on animal bodies. For example, Italian polymath Lazzaro Spallanzani experimented on bats at the end of the eighteenth century. He sought to understand the realities of their sensory worlds by literally obliterating various sensory organs in turn. He gouged out their eyes and burned their inner ears, before covering the gouged eye wounds with leather to block light from entering the ocular hole that was left behind.[43] He then put their bodies to the test in a maze that he had constructed in his laboratory. These experiments reflect a fundamentally biological way of thinking about where ability resides, within the body itself. French naturalist Louis Jurine undertook similar experiments around the same time to try to understand how bats navigated in the darkness.[44]

Violent experimentation was one strategy that naturalists deployed to attempt to get to grips with the functions of sensory adaptations of dark-adapted animals. But other strategies were less invasive, instead focusing on experimental observation. Amateur naturalist John D. Batten conducted experiments on bats at the end of the nineteenth century. Despite the passing of over a century since Spallanzani's and Jurine's experiments, in this later period, naturalists remained unsure about how bats inhabited their dark worlds, and echolocation was not identified as a key sense for many varieties of bat until the late 1930s.[45] Batten reported that:

---

[41] Lennard J. Davis, 'Introduction: Disability, Normality and Power', in *The Disability Studies Reader,* fifth edition (New York: Routledge, 2017), 1-14.
[42] Roger Cooter, 'Medicine and Modernity' in Mark Jackson (ed.), *The Oxford Handbook of the History of Medicine* (Oxford: OUP, 2013), 100-116.
[43] Lazzaro Spallanzani, 'Observations on the Origins of Vision in Bats', *Philosophical Magazine*, 1 (1798), 134-35; Sven Dijkgraaf, 'Spallanzani's Unpublished experiments on the Sensory Basis of Object Perception in Bats', *ISIS*, 61 (1960), 9-20.
[44] Louis Jurine, 'Experiments on Bats Deprived of Sight', *Philosophical Magazine*, 1 (1798), 136-47.
[45] On the discovery of echolocation see: Donald R. Griffin, *Listening in the Dark: The Acoustic Orientation of Bats and Men* (New York: Dover Publications, 1974).

> Common bats appear to me to be practically blind, not only in the light but also in the dusk. They could never see the mealworms with which I fed them, or the paint brush with which I gave them water, until it was within one third of an inch of their snouts … I am not sure that their hearing is very acute. They have failed to recognise the sound of mealworms crawling on the floor of the box – a sound which I could hear distinctly. The hearing of long-eared bats is evidently very sharp and I think they see better, too. Those that I have kept have been in every way more interesting and intelligent than the common bat.[46]

Batten observed these bats in an attempt to glean and test how ability operated, and where it resided. He judged long-eared bats as inherently more able than the common bat – a hierarchy of bat species – and connected sensory ability to intelligence. Further, he seems to criticise the common bat for not reacting to sensory stimuli that Batten deemed perfectly audible, at least to the human ear.

As scientific methods and processes changed shape, there continued to be an intense interest in taking bodies apart – looking at them in increasing depth – to identify the perceived roots of ability. With the emergence of neuroscience from around the 1960s, this interrogation of the body and its sensory organs became more precise.[47] Ability was seen as located in the finest structures in the body: in the nerve fibres of the sensory organs, in the neural pathways, and in various structures in the brain which were associated with different sensory capacities. An example of this way of assessing the dark-sensing body can be found in the study of the hedgehog. Experimentation, and dissection, of the 'olfactory bulb' in the hedgehog brain intensified from the 1960s, as scientists traced the relationship between the brain and a perceived heightened capacity for olfaction. In the 1990's, J. R. Alonso *et al* demonstrated how enlarged the bulb was in comparison to rodents, describing the hedgehog sensory structure as an 'extraordinary development.'[48] Within this language is a suggestion of progression and increased ability; in this schema, the bulb allows the hedgehog to be *especially able* when it comes to smelling. Similarly, life scientists investigating the neurology of the barn owl in the early 1980s, explored the ways in which auditory cues were 'mapped' within the animal's

[46] John Batten, *Nature Notes*, 6 (1895).
[47] Mitchell Glickstein, *Neuroscience: A Historical Introduction* (Cambridge, MA: MIT Press, 2014).
[48] J. R Alonso et al, 'NADPH-Diaphorase Active and CalbindinD-28k-Immunoreactive Neurons and Fibers in the Olfactory Bulb of the Hedgehog (Erinaceus europaeus)', *The Journal of Comparative Neurology*, 351, (1995), 307; Also see Konrad Herter, *Hedgehogs* (London: J. M. Dent & Sons Ltd. 1965), 8.

brain. In so doing, they sought the root of the species' nocturnal navigational capacities within the structures of brain itself.[49]

An intensification of the examination of animal bodies and anatomical structures reflected both changes over time, and important continuity. Across this expanse of time, there also developed a connected conceptualisation of ability where the focus was not only rooted in the animal form, but also emerged from an understanding of a coherence of specialised body and its wider environment. In other words, it was not the animal body *in isolation* that was understood to be able. This played out in the context of emerging theories of evolution – Lamarckian and, later, Darwinian – across the nineteenth century, which emphasised the significance of the wider environment on the transformations of animal bodies over time.[50] This shows that, as disability studies scholars have discussed, conceptualisations of ability and disability arise not only from the physical characteristics of a body, but from the relationships between diverse forms and their wider social, cultural, and environmental contexts.[51] Analysis of naturalists' texts illustrate the historical character of this relationship.

Such understandings of the entanglement of body and environment expanded in the late nineteenth century. People began to imagine and access places never before encountered, such as the oceanic depths. This, in turn, led to a deeper understanding of evolutionary processes and their complexities, in relation to apparently extreme bodies and their shrouded worlds. The naturalist John Lubbock suggested in the 1880s that the dark environment profoundly shaped the inhabitants of the deep sea: 'the abysses of the ocean are quite still, and black darkness reigns. The pressure of the water is also very great. Hence the deep seas have a peculiar fauna of their own.'[52] Lubbock recognised that the 'peculiar' body emerges under the influence of pressure and darkness. Naturalists were intrigued both by creatures with 'no eyes at all' – an adaptation found in both fish and crustacea – and the deep-sea inhabitants with 'enormously big ones.'[53] The biologist William Beebe, who was one of the first humans to visit the depths and its animal inhabitants in person, in a bathysphere, noted in 1932 that the 'darkness' had 'worked its magic' in producing the fauna of the deep. Such an extreme darkness was 'difficult

[49] Eric Knudsen and Phyllis Knudsen, 'Space-Mapped auditory projections from the inferior colliculus to the optic tectum in the barn owl (*Tyto alba*)', *Journal of Comparative Neurology*, 218 (1983), 187-196.
[50] For a classic exploration of the history of the idea of evolution see Peter J. Bowler, *Evolution: The History of an Idea* (Berkeley: University of California Press, 1984).
[51] On the social model of disability and its spatial implications, see Colin Barnes and Geoff Mercer (eds.), *Implementing the Social Model of Disability: Theory and Research* (Leeds: The Disability Press, 2004).
[52] Lubbock, *Senses, Instincts, and Intelligence of Animals*, 183.
[53] 'Deep-sea fish', *The Cornhill magazine* (1890), 534.

to picture', an environment whose conditions were: 'so intense, so absolute, that our blackest midnights in comparison are alight.'[54] Around the turn of the twentieth century, similar conversations were underway in relation to the impacts of darkness on the development of subterranean fauna and, often, deep sea and subterranean animals were discussed alongside each other in popular natural history.[55] Together, these examples evidence the established conviction that coherence between body and dark environment was crucial for a species to flourish.

Late nineteenth-century discourse relating to the blind cave fauna found in the subterranean systems of the American South referred to the 'perfect' coherence between the underground darkness and the sensory adaptations of the creatures.[56] Similarly, when discussing moles and their earthy environments, naturalist Thomas Bell asserted in 1874 that 'the general form of the body, which is nearly cylindrical, is calculated to facilitate its rapid progress through the subterranean passages.'[57] An appreciation of the ability to fit, within place, was clear. Across the period, dark-dwellers like these were often conversely imagined as thoroughly – perhaps even especially – able and yet at the same time often quite degenerate. An article on deep sea fish, published in 1890 in the British monthly, the *Cornhill Magazine,* suggested that the dark-adapted animal inhabitants of the deep are the 'dregs of the oceanic population', and yet 'in their own way' are 'most marvellously adapted.'[58] Such creatures, and their sensing bodies, were conceptualised as worthy of further study and examination, perhaps because of the tension between apparent deficiency and the seeming suitability of their bodies for the extreme world in which they lived.

In this context, there could also be a perceived incohesion between body and environment. In 1876, for example, popular scientific newspapers and periodicals reflected on the discovery of eyeless fishes in Savage mine, Nevada. These fish were extracted from the nearly scalding hot waters of the mine and placed immediately into cold water, where they

[54] William Beebe, 'The Depths of the Sea: Strange Life Forms a Mile Below the Surface', *The National Geographic Magazin*e, 61 (1932), 65-68.
[55] Flack, 'Dark Degenerations'; 'The Sense of Sight in Animals', *Chambers's Journal of Popular Literature, Science, and Art*s (17 June 1893), 373.
[56] Packard and Putnam, *Mammoth Cave and Its Inhabitants;* Putnam, "The Blind Fishes of the Mammoth Cave and Their Allies", *American Naturalist,* 6 (1*872*), 27–29
[57] Bell, *British Quadrupeds*, 87.
[58] This article also referred to such senses as 'thoroughly defective': 'Deep-sea fish', *The Cornhill magazine* (1890), 539.

'died almost instantly'.[59] Environmental change, therefore, was understood as generating significant material impacts on the lives of these creatures.

At the same time, the power of environmental phenomena to shape bodies was similarly perceived in relation to people, often in racialised contexts. Social Darwinism was one manifestation of the application of 'natural laws' to human bodies and societies.[60] The perception of coherence and incoherence of body and place connects these animal and human contexts. Indeed, Rosemarie Garland-Thomson conceptualised the notion of 'misfitting' as a phenomenon to help think through the relationship between body, space, and time: 'Fitting and misfitting denote an encounter in which two things come together in either harmony or disjunction … Each meeting between subject and environment will be a fit or misfit depending on the choreography that plays out.'[61] The perception of fitting within the environment – alongside the specific functions of sensory organs that we have identified – was an important element of the wider assessment of a body's ability not only to function, but to thrive.

Misfitting in a Transforming World

For a large proportion of the period since around 1800, naturalists tended to consider animal behaviour and adaptations in the context of a relatively unchanging environment. Transformations in the natural sciences, particularly those relating to geohistory, meant that the *de facto* arrangement between body and environment was imagined – in most circumstances – to be unchanging and harmonious, at least in the short term.[62] However, in the nineteenth century, seeds were sown that indicated that the natural world can and does change, sometimes in very radical ways. Darwin's vision was of a fundamentally violent nature, in which all beings – including humans – played their part. Increasingly across the twentieth century, there was growing evidence not only that environmental conditions change, but significantly, that humans can drive this change in profound ways.[63] In this context, there emerged a more fluid notion of what it meant to be able, and this is clear in relation to dark-adapted animals. Indeed,

[59] 'Table Talk', *Once a Week* (6 May 1876), 6.
[60] See Daniel Pick, *Faces of Degeneration: A European Disorder, c. 1848–c.1918* (Cambridge: CUP, 1989); Marja Märmänmaa and Christopher Nissen, *Decadence, Degeneration, and the End* (Basingstoke: Palgrave Macmillan, 2014); David Weir, *Decadence and the Making of Modernism* (Amherst: University Massachusetts Press, 1995).
[61] Rosemarie Garland-Thomson, 'Misfits: A Feminist Materialist Disability Concept', *Hypatia*, 26 (2011), 592.
[62] Martin J. S. Rudwick, *Bursting the Limits of Time: The Reconstruction of Geohistory in the Age of Revolution* (Chicago and London: University of Chicago Press, 2005).
[63] Here we refer to classic environmentalist works such as Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 1962). For more on the environmental movement see: Peter Coates, *Nature: Western Attitudes Since Ancient Times* (Berkeley: University of California Press, 2005); Eliza Griswold 'How Silent Spring Ignited the Environmental Movement', *New York Times* (21 September 2012).

this manifested in a focus on, and judgement of, the capacity of animals to respond to changes in their dark environments.

Environmental historians have illustrated, across diverse times and places, that the world has dramatically transformed, accelerating over the second half of the twentieth century, as people have changed environments to better suit themselves, their bodies, and their agendas.[64] Many scholars across the sciences and the humanities now recognise this period – our proposed current period – as the 'Anthropocene'. This is the epoch in which humans, emerging from the capitalist actions of those predominantly from the Global North, have had the dominant influence on climate, geology, and environment more generally, including its animal inhabitants.[65] Life scientists have recently discovered that this influence is felt across the planet's dark domains, even those – like the deep sea – that feel far removed from human activity. This emphasises the extraordinary reach of human power on a planetary scale. We have heavily adapted the world according to a wide range of economic, social, and cultural requirements, including through the construction of transport and lighting infrastructures, and urban planning. These are designed from and around the worldview of the dominant (normative, and 'able') human. Most humans are diurnal, predominantly visual creatures, both biologically and culturally, and adaptations to accommodate this have been highly consequential for all beings. It is now known, for instance, that the night is warming considerably faster than the day.[66] These anthropogenic transformations speak directly to the concerns of disability scholars. For example, Rosemarie Garland-Thomson notes in her treatise on misfitting that 'the primary negative effect of misfitting is exclusion… a literal casting out.'[67] This process, then, also applies to dark-dwelling animals marginalised within their own ecosystems.

---

[64] Varied examples include: Bathsheba Demuth, *Floating Coast: An Environmental History of the Bering Strait* (New York: W.W Norton & Company, 2019); John McNeill and Peter Engelke, *The Great Acceleration: An Environmental History of the Anthropocene since 1945* (Cambridge, MA: Harvard University Press, 2016); Jonathan Saha, *Colonizing Animals: Interspecies Empire in Myanmar* (Cambridge: Cambridge University Press, 2021); Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (Oxford: OUP, 2004).

[65] Much has been written on the Anthropocene concept, including its potential and its limitations, particularly regarding lack of representation and Eurocentrism. For a flavour of the concept and these debates see: Dipesh Chakrabarty, 'Anthropocene Time', *History and Theory*, 57 (2018), 5-32; Donna Haraway, 'Staying With the Trouble: Anthropocene, Capitalocene, Chthulucene' in Jason Moore (ed.) *Anthropocene or Capitalocene: Nature, History, and the Crisis of Capitalism* (Oakland, CA: PM Press, 2016), 34-77; Kathryn Yusoff, *A Billion Black Anthropocenes or None* (Minneapolis: University of Minnesota Press, 2018).

[66] Daniel Cox *et al*, "Global variation in diurnal asymmetry in temperature, cloud cover, specific humidity and precipitation and its association with leaf area index", *Global Change Biology* (September 2020): *https://doi.org/10.1111/gcb.15336*.

[67] Garland-Thomson, 'Misfits', 594.

Biologists Travis Longcore and Catherine Rich have shown that sources of ecological light pollution – from skyglow to lights on undersea research vessels – can disrupt the functions of dark ecosystems to varying degrees. A 'perpetual full moon', generated by artificial lighting, clearly favours species who are attracted to light over those who depend on darkness.[68] Indeed, life scientists Emma Louise Stone, Gareth Jones and Stephen Harris recently argued that artificial lighting substantially impacts on the commuting behaviour of horseshoe bats in the UK.[69] Lighting like this is erected for the benefit of people looking not only to access the night as a productive economic space, but also to mitigate against danger, real or imaginary. Turning to the deep sea, in 2020, a team of UK and Norwegian researchers found that deep sea creatures in the Arctic Ocean, ranging from zooplankton to fish, alter their behaviour and move away from even the faintest traces of light.[70] This has implications for the changing deep-sea environment as more light will reach the depths because of melting polar ice, and consequently animal lives and behaviours will be reconfigured. The result of these transformed environments is the exclusion and marginalisation of animals that depend on darkness. What works for the human animal does not necessarily help the non-human. Even the construction of wind turbines – ostensibly to aid a green transition – has had detrimental impacts on bat populations, disrupting navigation ways and sometimes leading to catastrophic internal damage to bat bodies.[71]

Another example is the European hedgehog, whose wide northern European habitats have been carved up in the last several decades. They have been isolated from each other by the construction of infrastructure designed for the benefit of people. Specifically, these animals have been impacted by the artificial lighting of roads and the smell of toxins generated by road infrastructure, and this in turn has reduced their capacity to access habitats that they have lived in for generations, as well as their capacity to thrive.[72] Furthermore, a 2020 study estimates that as many as 335,000 hedgehogs die each year on UK roads.[73] In 2018, there were an estimated

[68] Catherine Rich and Travis Longcore, *Ecological Consequences of Artificial Night Lighting* (Washington, D. C.: Island Press, 2005), 196.
[69] Emma Louise Stone, Gareth Jones and Stephen Harris, 'Street Lighting Disturbs Commuting Bats', *Current Biology*, 19 (2009), 1123-1127.
[70] Jørgen Berge et al, 'Artificial Light During the Polar Night Disrupts Arctic Fish and Zooplankton Behaviour Down to 200 m Depth' *Communications Biology*, 3 (2020). https://doi.org/10.1038/s42003-020-0807-6
[71] Paul Cryan and Robert Barclay, 'Causes of Bat Fatalities at Wind Turbines: Hypotheses and Predictions, *Journal of Mammalogy*, 19 (2009), 1330-1340.
[72] Hugh Warwick, *Hedgehog* (London: Reaktion, 2014).
[73] 'Hedgehog road deaths in UK 'as high as 335,000'' (18 October 2020), https://www.bbc.co.uk/news/uk-england-nottinghamshire-54524338 [Accessed 15/08/23]

one million hedgehogs in England, Scotland, and Wales, compared to a possible 30 million in the 1950s.[74]

Recognition of these changing environmental conditions arose fairly early in the twentieth century, significantly before the emergence of the environmental movement. Naturalists across the twentieth century perceived these changes and interpreted them in relation to ideas about ability and, indeed, changing descriptions of the hedgehog reflect this. But, more than that, they demonstrate a conceptualisation of ability which indicates the animal's perceived capacity to 'fit' within, and adapt to, this shifting environment. As early as the 1930s, people recognised the hedgehog as vulnerable within a 'modernising' world. The naturalist Arthur Thompson wrote that 'in my opinion, it is destined to become rarer for the reason that its sole means of defence, that of rolling itself into a ball, is no protection for modern conditions.' Framing the animals in terms of deficiency, he went on to note that the hedgehog is not fast enough to evade its enemies, including man, and that many more would die on the roads with the 'increase in traffic.'[75] Similarly, an article in the *Manchester Guardian* in 1938 declared that a hedgehog casualty in the Lake District – one as 'flat as a filleted plaice' – was at fault for creeping through the hedge and onto the road.[76]

Across the ensuing decades, as specialists interrogated hedgehog bodies and behaviours in greater depth, it was established that hedgehog and human lives and spaces were thoroughly connected; Konrad Herter suggested in the mid-1960s that the hedgehog should be seen 'not exactly as parasites but as 'followers of civilisation."[77] There is an element of culpability evident within these examples, a value judgement, directed at a hedgehog who was perceived as unable to keep up with human-induced environmental change. In such descriptions, environmental change at human hands was framed positively, as a sign of 'progress.' Such attitudes remained evident later in the century. A *Guardian* article from the 1980s noted hedgehogs' 'suicidal impulses', accusing them of paying 'no attention to a toot on the horn that sends most rabbits scurrying into the hedges', yet also reasoning that 'perhaps they are unlucky… it is the poor hedgehog that presses steadily on and is crushed.'[78]

[74] Helen Briggs, 'Hedgehog Numbers 'Down by Half' Warn Wildlife Groups' (7 February 2018) https://www.bbc.co.uk/news/science-environment-42959766 [Accessed 15/08/23]
[75] Arthur R Thompson, *Nature by Night* (London: Ivor Nicholson & Watson Ltd, 1931), 30-31.
[76] 'Country Lane: A Walk in the Lake District', *The Manchester Guardian* (24 June 1938), 8.
[77] Herter, *Hedgehogs*, 65.
[78] Harry Whewell, 'Animal Crackers', *The Guardian* (16 July 1982), 21.

From the mid-late twentieth century, blame was sometimes replaced by – or, as in this example, ran alongside – a narrative of care in the context of environmental change. This emerged out of the environmental and animal rights movements of the 1970s which influenced attitudes to wild nature across both global and local contexts. Nevertheless, this 'care' was still framed in relation to the hedgehog's perceived inability to survive unaided. People were consequently encouraged to check Bonfire Night woodpiles, and treacherous cattlegrids, for sheltering or trapped hogs. They might also abstain from littering plastic yoghurt pots that could ensnare a foraging hedgehog.[79] Such examples evidence an appreciation of the wide-ranging contexts in which humans impacted hedgehog lives, from the agricultural, to seasonal festivities, and the careless dropping of rubbish.

Narratives of caregiving did not only manifest in public messaging relating to environmental impacts but also, and increasingly, in terms of direct interventions at a species level by conservationists and animal advocates. A desire to 'rehabilitate' animals speaks to major themes in disability studies and disability history, specifically around the adaptation of built environments.[80] It took the form of conservation campaigns, including those to encourage homeowners to adapt their gardens to make them accessible to hedgehogs (the Hedgehog Street campaigns of the last decade or so).[81] Similarly, from the 1980s, and intensifying since then, road bridges – both above and under-ground – have been constructed across busy, heavily illuminated highways to aid bat navigation.[82] These work to physically separate the bat from the traffic, reducing instances of roadkill, whilst also seeking to minimise the disruption to echolocation calls caused by road noise. In addition, there have been efforts to develop lighting technologies that impact less on dark-adapted animals. For example, the past couple of decades have witnessed an increased sensitivity to the illumination of underground passages, and an associated desire among cave conservationists to preserve the deepest darkness for creatures adapted to living there. The British Caving Association has incorporated such concerns into their 'Minimal Impact Caving Guidelines', which include avoiding directly illuminating cave wildlife where possible, and a recognition that 'all human exploration of caves has some impact.'[83] In fact, suspicions had been voiced in the nineteenth century about the potentially

[79] Whewell, 'Animal Crackers', *The Guardian* (1982), 21; Graham Jones 'Hedgehog First Aid Scheme', *The Daily Telegraph* (12 October 1984), 13; Martin Wainwright, 'Bonfire Peril for Hedgehogs' *The Guardian* (1 November 1984), 7; 'Litter Louts, Killing Hedgehogs', *Telegraph* (28 July 1983).
[80] Tom Shakespeare, *Disability: The Basics* (London: Routledge, 2018).
[81] 'Hedgehog Street', www.hedgehogstreet.org [Accessed 15/ 08/23].
[82] John Altringham, *Bats: From Evolution to Conservation* (Oxford: OUP, 2011), 239-284.
[83] 'Cave Conservation ', British Caving Association https://british-caving.org.uk/our-work/cave-conservation/ [Accessed 15/08/23].

disruptive effects of newly installed electrical illumination on the dark-adapted fauna of Mammoth Cave, in Kentucky.[84] While this suggests an early recognition that key emblems of supposed western 'progress' – such as lighting systems – might work to the detriment of other species in the context of caves, it is significant that nothing was done about this problem until the later decades of the twentieth century, reflecting a fundamental shift.

In the discourse relating to the provision of care, there was also an emerging assessment of the bodies of individual animals, and direct interventions that impacted on those bodies. These were the 'damaged' bodies in places like conservation centres and animal hospices. The development of small mammal centres over the past several decades – places, within a British context, such as Tiggywinkles Wildlife Hospital in Buckinghamshire and Secret World Wildlife Rescue in Somerset, which both opened in the mid-1980s – are often premised on saving vulnerable animals from the dangers of the human world. The British Hedgehog Preservation Society was set up at a similar time.[85] Implicitly, such initiatives reflect, in part, a desire to remove 'misfitting' bodies from environments in which they appear unable to function. An article in the *Sandwell Evening Mail* in 1987, titled 'The angels from Tiggywinkle's', contains a photograph of a hedgehog captioned 'another road accident victim' – one who was 'saved with the aid of a plaster cast.'[86] Here, the victimised animal figure depends on the human 'angel' figure not only to live but to be restored, made able one more, and possibly reintroduced to the wild.

These examples suggest a perceived state of dependence – a vulnerability – demonstrated through an appraisal of an animal's remaining ability, and a judgement of their capacity to change. In this context, some animals were construed as inherently vulnerable, and even weak. These discourses of care and adaptation reflect not only perspectives on the animal, but also, implicitly, a belief in the power of the human to transform animal bodies and the wider world. 'Broken' animals were seen as unable to adapt quickly enough to anthropogenic environmental conditions, and therefore as requiring the apparently *more able* human to undertake the adaptation process on their behalf (i.e., to rehabilitate them). Indeed, captive breeding in zoos represents a similar process of removing 'damaged' – vulnerable, now ill-adapted species – from their wider settings and placing them in care-giving and rehabilitative

[84] *Weekly Trinity Journal* (15 Nov 1879).
[85] 'British Hedgehog Preservation Society' https://www.britishhedgehogs.org.uk/ [Accessed 15/08/23]; 'Secret World', https://www.secretworld.org/ [Accessed 15/08/23]; 'Tiggywinkles', www.tiggtwinkles.co.uk [accessed 15/08/23].
[86] 'The Angels from St Tiggywinkle's', *Sandwell Evening Mail* (17 October 1987), 4.

institutions. The image of the ark, employed by zoos since the mid-1980s, also suggests a relocation and institutionalisation of 'misfitting' bodies, and their increasing dependence on a dominant human caregiver.[87] The Bristol Zoo, for instance, reframed its image in the mid-1980s, making the Ark prominent in their branding. This was designed to communicate a commitment to animal rescue in the context of a threatened planetary environment.[88] Of course, these examples resonate somewhat with the broader, and earlier, histories of institutionalisation in the human context.[89] But more than that, they reveal the presence of several layers of 'care' operating in social and cultural contexts across global and national scales. This reflects the broad constellation of ideas about ability that shaped how people imagined and treated animals.

The 1980s was clearly a significant moment for the emergence of diverse ways of thinking about environmental stewardship. At the planetary level, the 'care' offered by zoological societies reflected a sense of the world as desperately in need of rescue. The decade was also a turbulent time which provoked increasingly nationalistic thinking. In the British context, this arose from a Thatcherite conservativism, a resurgent white nationalism, shifting economic realities, as well as an interest in the landscape as a reflector of identity.[90] Animals could be symbolic in this context, imbued with powerful ideas about people and places. The Hedgehog Preservation Society, for example, directed its stewardship mission narrowly and nationalistically. Set up in 1982, it was explicitly 'dedicated to helping & protecting hedgehogs native to the UK'.[91] Of course, hedgehogs in Britain are not 'British', they are part of the broader European hedgehog species. But, by this time, the hedgehog was seen as one of the quintessential British animals, emblematic of British landscape, history, and culture.[92] Britishness itself was at stake here, in the form of the enigmatic but endangered hedgehog.

---

[87] See Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London: Reaktion, 2001).
[88] Flack, Chapter 2, *The Wild Within.*
[89] Catherine Cox and Hilary Marland, "A Burden on the County': Madness, Institutions of Confinement and the Irish Patient in Victorian Lancashire', *Social History of Medicine*, 28 (2015), 263-87; Michael Remis, Catherine J. Kudlick and Kim E. Nielsen, Part III, *The Oxford Handbook of Disability History* (Oxford: OUP, 2018); Jan Warmsely, 'Institutionalization: A Historical Perspective', Kelley Johnson and Rannveig Traustadottir (eds.) *Deinstitutionalization and People with Intellectual Disabilities* (London: Jessica Kingsley Publishers, 2005), 50-65.
[90] Amy Edwards, *Are We Rich Yet? The Rise of Mass Investment Culture in Contemporary Britain* (Berkeley: University of California Press, 2022); Alwyn Turner, *Rejoice! Rejoice: Britain in the 1980s* (New York: Aurum Press, 2010)
[91] 'British Hedgehog Preservation Society', https://www.britishhedgehogs.org.uk/ [accessed 15/08/23].
[92] For more on animals and nationality see: Ritvo's *The Animal Estate* and Peter Coates, *Squirrel Nation: Reds, Greys and the Meaning of Home* (London: Reaktion, 2023).

In other circumstances, the urge to directly intervene in relation to such creatures manifested in euthanasia. These are secretive practices, but it is possible to locate their traces by looking, in some cases, beyond our dark context. Euthanasia was construed as a form of care – a judgement on the residual value of the 'broken' animal body, and a desire to prevent suffering by removing it from a world in which it could no longer fit. Certainly, euthanasia in animal-facing institutions is nothing new. Philip Howell, for example, details such processes in the nineteenth-century Battersea Dogs and Cats Home.[93] The current RSPCA guidelines around euthanasia state that 'we euthanase an animal only if this is in the best interest of their welfare. This means preventing further suffering, whether that's physical or mental, if they can't be rehabilitated with a view to either release (if wild) or rehome (if domestic).'[94] This statement reflects a broadening of the value judgements about 'broken' animal bodies to include psychological 'misfitting'. For example, Bristol Zoo euthanised a 'mad' polar bear in the early 1990s, after years of him exhibiting signs of mental disturbance. When polar bears had exhibited similar signs of psychological distress over the century of more preceding this, they were generally seen as sources of entertainment.[95] These might be highly complex emotional, economic, and practical interactions and interventions, but they are nonetheless premised on an imbalance of power between species and a range of value judgements. These judgements relate not only to the perceived ability of individual creatures to adapt to fast-changing circumstances, but also pertain to the very value of life itself. It is the comparatively able human who makes this final judgement.

Sometimes, though, judgements about animals and their abilities could be framed at the opposite extreme. The perceived capacity of animals to rapidly adapt was increasingly recognised, and often much appreciated. For instance, while some naturalists saw the hedgehog as misfitting within a fast-changing world, other writers, such as Alan Bartram, writing in 1974, judged that they were not 'fussy' animals, inferring that part of their ability lay in their capacity to readily change behaviour.[96] Since the middle of the twentieth century, people have often viewed foxes as having taken great advantage of urban expansion and fast-food and wastage culture. Expanding populations of foxes adapted to urban night-times have – in many quarters

[93] Philip Howell, Chapter 6, *At Home and Astray: The Domestic Dog in Victorian* Britain (Charlottesville: University of Virginia Press, 2015); Chris Pearson, 'Suffering', *Dogopolis*, 83-114.
[94] 'RSPCA' https://www.rspca.org.uk/whatwedo/care/rehabilitation/euthanasia [Accessed 15/08/23].
[95] Andrew Flack, 'In Sight, Insane: Animal Agency, Captivity and the Frozen Wilderness', *Environment and History*, 22 (2016), 629-52. On animal mental illness more broadly, see Laurel Braitman, *Animal Madness: How Anxious Dogs, Compulsive Parrots, and Elephants in Recovery Help Us Understand Ourselves* (New York: Simon & Schuster, 2015).
[96] Alan Bartram, *Hedgehogs* (London: Priory Press Limited, 1974), 75.

– been welcomed by residents of British towns and cities, as well as by fox-specialists.[97] Research has also revealed that peregrine falcons – already viewed as well adapted to urban structures like skyscrapers, and usually active in the daylight hours – have further adapted their behaviour to adapt to artificial lighting as they hunt and feed at night. A recent article published in the *Journal of Raptor Research* reported the adaptability of these creatures in a widely positive light, reflecting an appreciation of the development of newly acquired abilities.[98] Similarly, bat specialist John Altringham recognises that bat populations in general are suffering in the midst of rapid environmental change, but also emphasises that some bats can be 'very adaptable' and that many have taken advantage of the 'abundance' of roosting opportunities offered within growing towns and cities.[99] Environmental historian Dolly Jørgensen has pointed to the emergence of such bat roosts in Houston, Texas, since the mid-1980s.[100] Recognition of what might be thought of as surprising adaptations – in a world that feels more and more despoiled by people – is part of a complex matrix of attitudes and ideas about animal bodies and abilities, rooted in place and time. Value judgements – including those relating to animal ability – seem to be inescapable to people trying to understand and inhabit a diverse natural world.

Conclusion

Through the lens of the study of dark-dwelling creatures, produced across the modern period, we have illustrated that the conceptualisation of ability is multifaceted, fluid, contingent, and changeable over time. This is in response to transforming power dynamics and changing environmental, social, and political contexts. Such complexity reinforces the urgency of deeper historical interrogations of the idea of ability across multiple contexts. Indeed, it is crucial that historians think carefully and closely about what it means – and has meant – to be able and adaptable because these sets of ideas resulted in living beings 'fitting' or misfitting' across a range of environments. This work is, perhaps, of particular urgency in a world where significant change appears to be the new norm. Recent findings, for example, suggest that the human animal may not be able to adapt in time to face emerging diseases in the context of climate

[97] Georgia Nelson, 'The Urban Fox Is Here to Stay': Foxes and People in Bristol, 1930-1990' (University of Bristol Undergraduate Dissertation, 2022); Martin Wallen, *Fox* (London: Reaktion, 2006).
[98] Esther Kettel, Louise Gentle and Richard Yarnell, 'Evidence of an Urban Peregrine Falcon (*Falco peregrinus*) Feeding Young at Night', *Journal of Raptor Research*, 50 (2016), 321-323.
[99] Altringham, *Bats*, 239-284.
[100] Dolly Jørgensen, 'Backyard Birds & Human-made Bat Houses: Domiciles of the Wild in 19th and 20th Century Cities' in Clemens Wischermann, Aline Steinbrecher and Philip Howell (eds.) *Animal History in the Modern City: Exploring Liminality* (London: Bloomsbury Academic, 2018).

crisis. Events such as drought, floods, and sea level rises 'bring pathogens closer to people' and favour a proliferation of creatures such as mosquitoes and ticks, the so-called 'pests'.[101] They also result in the mass migration of people between diverse environments and the further marginalisation of many nonhuman animals. At the same time, human (and, assumingly, other animals') immune systems are weakened by such increasingly extreme environmental conditions.[102] In these kinds of contexts, a much more nuanced understanding of ability and adaptation across diverse species may become imperative. One size does not fit all.

Deconstruction of the idea of ability across place and time also matters to historians much more broadly. Like the environmental historian William Cronon's troubling of the concept of wilderness, ability is an example of an idea that often passes beyond the radar of our perception.[103] It is everywhere and yet rarely recognised. In this article, we have constructed a critical ability history to show what is possible when we interrogate everyday ideas. In this way, this serves as a timely reminder to the discipline to keep returning to the mundane and the apparently obvious because such things may matter, not only to our understandings of the past, but also to the ways in which we navigate an uncertain future.

[101] Tristan McKenzie, Camilo Mora and Hannah von Hammerstein, '58 % of Human Infectious Diseases Can be Worsened by Climate Change – We Scoured 77,000 Studies to Map the Pathways', *The Conversation* (8 August 2022) https://theconversation.com/58-of-human-infectious-diseases-can-be-worsened-by-climate-change-we-scoured-77-000-studies-to-map-the-pathways-188256 [Accessed 17/08/23]. See also: Eben Kirksey, 'The Emergence of COVID-19: A Multispecies Story,' *Anthropology Now*, 12 (2020), 11-16.

[102] Sara Goudazi, 'How a warming climate could affect the spread of diseases similar to COVID-19', *Scientific American* (29 April 2020), https://www.scientificamerican.com/article/how-a-warming-climate-could-affect-the-spread-of-diseases-similar-to-covid-19/ [Accessed 15/08/23], See: Katie Holmes, Andrea Gaynor and Ruth Morgan 'Doing Environmental History in Urgent Times' *History Australia*, 17 (2020), 230-251; Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, MA: Harvard University Press, 2013).

[103] William Cronon, 'The Trouble with Wilderness; or Getting back to the Wrong Nature', in *Uncommon Ground: Rethinking the Human Place in Nature* (New York: W. W. Norton & Co., 1995), 69-90.