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# A Victorian extinction: Alfred Newton and the evolution of animal protection

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**Abstract.** The modern concept of extinction emerged in the Victorian period, though its chief proponent is seldom remembered today. Alfred Newton, for four decades the professor of zoology and comparative anatomy at Cambridge, was an expert on rare and extinct birds as well as on what he called 'the exterminating process'. Combining traditional comparative morphology with Darwinian natural selection, Newton developed a particular sense of extinction that helped to shape contemporary, and subsequent, animal protection. Because he understood extinction as a process to be studied scientifically, and because he made that, rather than animal cruelty, the focus of animal protection, Newton provides an important window onto the relationship between science and sentiment in this period. Newton's efforts to bring the two into line around the issue of human-caused extinction reveal an important moment in which the boundaries between science and sentiment, and between those who did and those who did not have the authority to speak for nature, were up for grabs.

## 'A right feeling'

Extinction was a Victorian idea. While the concept has a longer history, it assumed its modern form during the 1860s and 1870s in Britain. It was then, in the wake of the publication of Charles Darwin's *Origin of Species* and in the context of mid-Victorian anxieties about the natural world and human impacts on it, that the process of extinction became an object of both natural-historical research and widespread alarm. These two aspects of extinction evolved together: naturalists' understanding of 'the exterminating process' was crucially intertwined with concerns that those naturalists shared with the

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wider public. In what follows, the complex arc of this concept is traced through the work of its chief proponent: Alfred Newton, the University of Cambridge's first professor of zoology and comparative anatomy. Newton's understanding of extinction – which, in its basic form, we share today – coalesced out of a particular moment in Victorian thought, shaped by his early adoption of Darwinian natural selection as well as his complex views on the proper relationship between science and sentiment.

It is no small irony that the man who framed our modern concept of extinction is largely unknown today. However, to the extent that this essay plucks Newton from obscurity, it does so neither to restore his status as an acknowledged expert on extinction nor to highlight the positive impact of the legislative acts he helped to write. Instead, Newton's life and work reveal a particular moment in the history of Victorian Britain and in the history of science. It was a moment in which the boundaries between science and sentiment, and between those who did and those who did not have the authority to speak for nature, were being redrawn. The relationship between science, sentiment and cultural authority was a point of interest for many Victorians, a fact reflected in the expansive historical literature on the topic.[1] Newton, like many of his contemporaries, was ambivalent about this relationship: sentiment – whether a feeling, a passion or the whole of public opinion – was neither entirely good nor inevitably pernicious. Rather, it was viewed as a necessary element of social life, one that Newton sought to channel, in the context of animal protection, in a direction established by scientific study.[2]

To this end, Newton distinguished between two types of sentimentalist, 'the difference between which', he argued, 'has not been so clearly recognised'. There were those, on the one hand, who were opposed to the killing of birds for almost any reason, the 'mere sentimentalists' to whom 'times and seasons are of no account'. On the other hand, there were those who acknowledged the dominion of man over nature, but asked only that it not be abused; they allowed their 'sentiment to be governed by common-sense', and constrained killing only because they felt 'bound not to exterminate or to extirpate'.[3]

1 On the slipperiness of the barrier between science and sentiment (or sensibility) in the eighteenth century see, for example, Emma C. Spary, *Utopia's Garden: French Natural History from Old Regime to Revolution*, Chicago: University of Chicago Press, 2000, esp. Chapter 5; Jessica Riskin, *Science in the Age of Sensibility: The Sentimental Empiricists of the French Enlightenment*, Chicago: University of Chicago Press, 2002; and William Clark, Jan Golinski and Simon Schaffer (eds.), *The Sciences in Enlightened Europe*, Chicago: University of Chicago Press, 1999, especially Part 3, 'Humans and Natures', pp. 169–304. Moving into the nineteenth century, the divide between science and sentiment gains new salience as an actor's category. This transition is documented, with a provocatively broad brush, in Lorraine Daston and Peter Galison, *Objectivity*, Cambridge, MA: Zone, 2007, esp. Chapters 3 and 4.

2 On this more explicitly Victorian approach to the 'problem' of sentiment and emotions in natural history see Jim Endersby, 'Sympathetic science: Charles Darwin, Joseph Hooker, and the passions of Victorian naturalists', *Victorian Studies* (2009) 51, pp. 299–320; and a recent 'Focus Section' in *Isis*: Paul White (ed.), 'Focus: the emotional economy of science', *Isis* (2009) 100, pp. 792–851. Two crucial sources on the problem of the boundaries and nature of scientific knowledge in this period are Bernard Lightman (ed.), *Victorian Science in Context*, Chicago: University of Chicago Press, 1997; and Martin Daunton (ed.), *The Organisation of Knowledge in Victorian Britain*, Oxford: Oxford University Press, 2005.

3 [Alfred Newton], '1. Report on the practicability of establishing 'A Close Time' for the protection of indigenous animals, by a Committee appointed by the British Association, 1869–1880. British Association Reports. London; 2. The Wild Birds' Protection Act 1880, with Explanatory Notes. London ("Field" Office) 1880', *Quarterly Review* (1881) 151(301), pp. 100–114, 102–103.

Newton deemed the latter sense of sentiment 'a right feeling – a feeling sanctioned by humanity, by Science, and by our own material interests'. Too much of the former type, he feared, would leave animal protection in the hands of the 'humanitarians and sentimentalists, whose efforts are sure to be brought to nothing through ignorance and excess of zeal'.[4] The existence of sentiment was a given – its control, on both an individual and a societal level, was what was essential to Newton's vision of successful nature protection and the proper place of knowledge possessed by naturalists like himself in such a movement.

The particular kind of preservation Newton advocated grew out of a particular understanding of extinction. Newton's concept of extinction, like his sense of sentiment, was bifocal: it could occur naturally, as a consequence of Darwinian natural selection, or artificially, as the result of wanton destruction by humans. The former, if not *good*, was at least *natural*; the latter was neither good nor natural. Rather, it was, in Newton's view, the evil product of human ignorance against which the only assured prevention was the proper application of the expert judgement of scientific naturalists. Darwin's theory both folded extinction into the order of things and gave Newton something against which to define the abrupt destruction of humans. For him, a feeling against extinction was a feeling on behalf of a class of organisms as a whole – usually a species – whereas a feeling against cruelty, typical of existing agitation on behalf of animals, was a feeling on behalf of individual organisms. The latter was, in his words, 'hardly connected with the preservation of birds and animals'.[5] By turning extinction into an object of scientific study and reorienting animal protection around it, Newton was intervening in an ongoing conversation about the value of science in wider society.

For Newton, science and sentiment were not necessarily opposed – indeed, for animal protection to succeed they would have to work in tandem. Still, we have to remind ourselves of his ambivalence so that we do not miss the cautionary tone in his public pronouncements. When, for example, he told the British Association for the Advancement of Science (BAAS) in 1876 that 'there is happily a strong disposition, which grows stronger day by day, to preserve our wild animals', he was both optimistic and wary about the situation.[6] Such a disposition, though necessary for the success of the protective measures he sought, was also dangerous – 'sentiment', as Newton himself referred to it, was a double-edged sword that, if wielded unwisely, could cleave public policy from the expert science upon which he felt it depended.[7] Significantly, Newton shared this ambivalence, as well as his more general sense of the relationship between

4 Alfred Newton, 'Address to the Department of Botany and Zoology', in *Report of the Forty-Fifth Annual Meeting of the British Association for the Advancement of Science*, London: John Murray, 1876, pp. 119–125, 125.

5 Alfred Newton, 'Testimony before the Select Committee on Wild Birds Protection', 19 June 1873, 'Report from the Select Committee on Wild Birds Protection', p. 34. A copy of these proceedings is held in a bound volume entitled 'Bird Preservation' in Cambridge University Library, MS Add. 9839/5/1, Alfred Newton Papers, henceforth CUL, MS Add. 9839/5/1.

6 Newton, op. cit. (4), p. 125.

7 In this essay, the category of 'sentiment' has been chosen – over, for example, 'feelings' or 'emotions' – because it dominated the discussions of Newton and his contemporaries.

knowledge and politics, with many of his peers.[8] In Newton's scientific work and the advocacy he based on it, we see a delicate balancing act of ideas and values in action; through the lens of extinction, we gain a window onto the wider cultural authority of science in the Victorian period.

## 'The exterminating process'

Alfred Newton was born on 11 June 1829, into a relatively well-connected and well-off family.[9] From an early age he was fascinated with nature, and especially birdlife, and fuelled his interests in the country around his family's estate. After taking his degree from Magdalene College, Cambridge, in 1853, Newton was awarded a fellowship to pursue the sort of travel still seen, at mid-century, as essential to the development of a good naturalist.[10] He made good on these aims by spending the next dozen years travelling and collecting in the West Indies, North America, Scandinavia and Madeira, with occasional stopovers in the rooms he was allowed to keep at Magdalene for the duration of the fellowship. Consciously acting within the established tradition of natural-historical travel, Newton intended his observations and collections to serve as both personal education and social advancement, in his case within the growing community of scientific ornithologists back home. It was a community Newton himself went a long way towards founding: it was in Newton's rooms at Magdalene, for example, that the British Ornithologists' Union first met in 1858.[11]

That same year, Newton went looking for a lost bird. The great auk (*Alca impennis*), a flightless seabird once spread widely across the North Atlantic, had been rumoured extinct for over a decade. Great auks had once formed huge summer breeding colonies on rocky offshore islets, a strategy common among seabirds but ultimately disastrous for the flightless great auk. Its vast colonies on low-lying rocks were like buffet dinners for hungry sailors who, starved of fresh meat for months, would race ashore during summer

8 On the more general significance of the boundary between science and non-science and of the discourse between the two in this period see Martin Fichman, 'Biology and politics: defining the boundaries', in Lightman, op. cit. (2), pp. 94–118.

9 His father, William, owned a set of sugar plantations in the West Indies and was Member of Parliament for Ipswich, while his mother, Elizabeth, was herself the daughter of the MP for York. The only monograph-length biography of Newton was commissioned immediately after his death and was written by a former student. See A.F.R. Wollaston, *Life of Alfred Newton: Professor of Comparative Anatomy, Cambridge University, 1866–1907*, London: J. Murray, 1921. For further biographical details see David E. Evans, 'Newton, Alfred (1829–1907)', *Oxford Dictionary of National Biography*, Oxford: Oxford University Press, 2004; and Shelley Innes, 'Alfred Newton', in Bernard Lightman (ed.), *Dictionary of Nineteenth-Century British Scientists*, Chicago: University of Chicago Press, 2004, pp. 1474–1476.

10 The literature on natural-historical travel in this period is immense, but for instructive examples about its importance for the training of naturalists see Jim Endersby, *Imperial Nature: Joseph Hooker and the Practices of Victorian Science*, Chicago: University of Chicago Press, 2008; Aaron Sachs, *The Humboldt Current: Nineteenth-Century Exploration and the Roots of American Environmentalism*, New York: Penguin, 2006; and E. Janet Browne, *Charles Darwin: Voyaging: A Biography*, Princeton: Princeton University Press, 1995.

11 On the rise of ornithology as both a discipline and a profession see Paul Farber, *The Emergence of Ornithology as a Scientific Discipline, 1760–1850*, Boston: D. Reidel Publishing Company, 1982; and Mark V. Barrow Jr, *A Passion for Birds: American Ornithology after Audubon*, Princeton: Princeton University Press, 1998.

stopovers and bludgeon or net as many great auks as they could. Increased transatlantic travel led to diminished great auk populations, and by the nineteenth century encounters had become infrequent. The last confirmed sighting took place off the coast of Iceland in June of 1844, and, despite numerous subsequent sightings, that date quickly became fixed as the 'precise' moment at which the species went extinct.[12]

According to Newton's account of the voyage, he sailed to Iceland hoping to prove the rumours wrong.[13] Struck by the rapidity of the great auk's disappearance, his mission was part search and rescue and part quest for answers – if he failed to find a living bird, he at least hoped to gather as much information as possible about the process that had led to its demise. Though no living auks turned up, Newton made good on the latter goal – so much so that the collation of those findings would occupy him on and off for the rest of his life. What emerged from Newton's research was puzzling: while naturalists increasingly recognized the impact of indirect pressures like habitat destruction on animal populations, the great auk's demise seemed to have been a product of direct exploitation. That humans could have driven so widespread a species from the world one by one, and done so with such rapidity, seemed impossible.[14] Though familiar with human-caused extinctions like that of the dodo, famously extinguished on its native island of Mauritius around the year 1680, naturalists found it harder to comprehend the capacity of human action to destroy a species as widespread as the great auk.[15]

Naturalists were confused about the great auk in part because they were confused about extinction in general. This confusion stemmed from broader changes in the ways naturalists understood the large-scale processes that structured the natural world. Charles Lyell's *Principles of Geology*, and the uniformitarian philosophy that underlay it, paved the way: by eschewing catastrophes in favour of gradual processes to explain the Earth's past, Lyell helped reorient natural history around dynamic processes (an approach, it bears noting, that proved especially influential on a young Charles Darwin).[16] This conceptual shift occurred alongside increasing recognition that

12 The most comprehensive source on the great auk is Errol Fuller, *The Great Auk*, Southborough: Errol Fuller, 1999. The story of the auk's extinction, and the fixing of 1844 as its 'date', appears on p. 359, as well as in, for example, W.R.P. Bourne, 'The story of the great auk (*Pinguinis impennis*)', *Archives of Natural History* (1993) 20, pp. 257–278. The persistence of the idea of this story's 'precision' is embodied in an exhibit case entitled 'Exploring Extinction' at the Harvard Museum of Natural History, in which a great auk specimen is accompanied by a plaque that reads, in part, 'There are no species on earth for which the precise date and time of extinction is known, except, perhaps, for the Great Auk.'

13 An account of Newton's travels can be found in Wollaston, op. cit. (9), pp. 11–39 and 73–92.

14 Modern ecologists would recognize a density-dependent non-linearity – the Allee effect – at work in the rapid depletion of such huge populations, but for Victorian naturalists the loss was largely a mystery. See Tim Halliday, *Vanishing Birds: Their Natural History and Conservation*, Austin: Holt, Rinehart, and Winston, 1978, p. 41; and Fuller, op. cit. (12), p. 63.

15 According to some historians of the brief seventeenth-century encounter between European sailors and the dodo, the bird tended to be understood more as an exotic aberration than a viable link in the chain of being. Confined to a tiny, distant island, encountered ephemerally, and leaving few remains, the Dodo ascended to the realm of the mythical almost immediately. For the most complete treatment of the topic see Errol Fuller, *Dodo: From Extinction to Icon*, London: Collins, 2002.

16 The most comprehensive source on this topic is Martin J.S. Rudwick, *Worlds before Adam: The Reconstruction of Geohistory in the Age of Reform*, Chicago: The University of Chicago Press, 2008; see also his *The Meaning of Fossils: Episodes in the History of Paleontology*, 2nd edn, Chicago: University of Chicago

extinction, long recognized in the geological record, could take place in the present as well.[17] The stage was set for a new conceptualization of extinctions less as past events and more as ongoing processes. It was in this context that speculation about the great auk's fate arose, and it is to this destabilization of naturalists' understanding of natural processes that we can attribute the confusion that accompanied Newton's search.

Some, like the ornithologist James Orton, made the fatalistic assumption that so numerous a species could only have disappeared 'because time fought against it'.[18] Orton's strange statement was part of an ongoing debate over the nature of extinction itself: naturalists disagreed about whether it stemmed from external or internal factors – from environmental forces or from something inherent in the animal itself. As Richard Owen put it in 1859, 'whether [extinction] be inherent in [creatures'] own nature, or be relative and dependent on inevitable changes in the conditions and theatre of their existence, is the main subject for consideration'.[19] A taxonomic mix-up also played a role in the confusion over the great auk's decline: because it had long been mistaken for the penguin of the southern hemisphere (though the two occupy different taxonomic orders), many assumed that great auks were distributed well up into the Arctic Circle based purely on analogy to its antipodean double.[20] Thus widespread uncertainty – over taxonomy and over the nature of extinction – enabled Newton to remain hopeful that a great auk might turn up as he traversed Iceland interviewing fishermen and coastal residents in 1858.[21]

It was a hope Newton clung to for some years after his return. He devoted part of an 1863 account of his travels to a plea to 'lay' naturalists to capture alive any auks they might encounter.[22] Just two years later, though, when he published an essay called 'The gare-fowl and its historians', Newton meant 'historians' in the full sense of the term. 'For all practical purposes', he wrote, 'we may speak of it as a thing of the past'. While this was a tragic concession, Newton was determined not to let the auk pass into history without some lessons for contemporary naturalists: 'Regarded in this light', he continued

Press, 1985, especially Chapter 4, 'Uniformity and progress', pp. 164–217. The best source on Lyell's *Principles* is James A. Secord, 'Introduction', in Charles Lyell, *Principles of Geology*, New York: Penguin Classics, 1997 (first published 1830–32), pp. ix–xliii. Lyell's impact on Darwin is well documented, not least by Darwin himself. See, for example, Sandra Herbert, *Charles Darwin, Geologist*, Ithaca: Cornell University Press, 2005; and Rudwick, op. cit., pp. 347–362.

17 For a brief treatment of the link between 'process thinking' and the idea of extinction see John Damuth, 'Extinction', in Evelyn Fox Keller and Elizabeth Lloyd (eds.), *Keywords in Evolutionary Biology*, Cambridge, MA: Harvard University Press, 1992, pp. 106–111.

18 James Orton, 'The great auk', *American Naturalist* (1870) 4, pp. 539–542, 542.

19 Richard Owen, 'On the extinction of species', in, *idem*, *On the Classification and Geographical Distribution of the Mammalia*, London: J. W. Parker & Son, 1859, p. 56, Appendix A.

20 For a full treatment of the causes of this confusion see Fuller, op. cit. (12), pp. 52–87; and Jeremy Gaskell, *Who Killed the Great Auk?*, Oxford: Oxford University Press, 2000, pp. 125–150.

21 James Fisher, 'Alfred Newton and the auk', *Bird Notes and News* (1945) 21, p. 76.

22 Alfred Newton, 'Notes on the ornithology of Iceland', Appendix A in Sabine Baring-Gould, *Iceland: Its Scenes and Sagas*, London: Smith, Elder, and Co., 1863, pp. 399–421. 'Lay' was the term Newton chose to frame the portion of that essay directed specifically at his audience. On the prevalence of this designation, and on the problems associated with defining what was understood as non-lay, see Ruth Barton, '"Men of science": language, identity, and professionalization in the mid-Victorian scientific community', *History of Science* (2003) 41, pp. 73–119.

in the same 1865 essay, 'the subject becomes even more than interesting, because owing to the recent date of the bird's extirpation (whether completed or not), we possess much more information respecting the exterminating process, than we do in the case of any other extinct species'.[23]

Newton's language here – 'the exterminating process' – affords a crucial insight into his early understanding of extinction. When asked by a Parliamentary select committee in 1873 whether he had 'observed the habits of birds for a very long time', Newton focused his answer on extinction:

> I have paid a good deal of attention to the subject of the extermination of birds in various countries, and the causes that have produced it. Of course when I speak of the extermination of birds, I also mean the preliminary process; that is to say, making them grow rare.[24]

Whereas naturalists had long studied past extinctions (those evidenced in the geological record), Newton was one of the first to claim expertise on extinction as a process – on 'the exterminating process'. While Newton's effort to balance science and sentiment was nothing new, his innovation was to insist that the combination of the two called forth by the issue of extinction made naturalists necessary in the policy process. Their special knowledge gave them 'the power of coping successfully with the difficult questions that [would] arise' as they tried to steer the public, and its sentiments, toward the proper objects of protection as determined by scientific criteria only they could assess.[25] Turning extinction into a process to be studied by naturalists had the related effect of turning naturalists into advisers on matters of policy. Now all that remained was to convince the public that they needed the advice at all.[26]

According to his biographer, Newton's search in Iceland sparked a 'peculiar attraction' to 'extinct and disappearing faunas'.[27] It was this attraction that led Newton to study other extinct and rare birds, including the dodo and the great bustard, a bird extirpated from Britain within living memory. The key point, however, is that Newton moved beyond cataloguing or anatomizing these extinct birds and took up the process of extinction itself as an object of study. This focus on 'the exterminating process', combined with his early adoption of Darwinian natural selection, is at the core of Newton's understanding of extinction. As will be explained in the next section, the fact that extinction was central to the dynamics of natural selection was crucial to Newton's evolving sense of it, and especially to his convenient, if not always coherent, binary sense of it as an either natural (Darwinian) or unnatural (human-caused) process. The need to tell the difference between the two – requiring a naturalist to determine when, as in the latter case alone, a policy intervention was necessary – paved the way for an animal

23 Alfred Newton, 'The gare-fowl and its historians', *Natural History Review* (1865) 5, pp. 467–487, 487.

24 Newton, op. cit. (5), p. 32.

25 Newton, op. cit. (4), p. 125.

26 On the larger issue of turning the government into a 'client' for science, though with the distinction of remuneration (which Newton never sought), see John C. Waller, 'Gentlemanly men of science: Sir Francis Galton and the professionalization of the British life-sciences', *Journal of the History of Biology* (2001) 34, pp. 83–114, 102.

27 Wollaston, op. cit. (9), p. 52.

protection movement that self-consciously married science and sentiment. Newton's experience with the great auk, and his sense that the recent occurrence and human cause of its extinction made it a valuable window onto the 'exterminating process', set the stage for his subsequent scientific work and political advocacy on behalf of endangered animals.

## 'Early days of Darwinism'

On his way home from Iceland in 1858, Newton received the issue of the *Proceedings of the Linnean Society* containing the papers of Charles Darwin and Alfred Russel Wallace on evolution by natural selection. He was, by his own account, immediately won over to the theory, remaining a staunch Darwinian for the rest of his career.[28] Both contemporaries and historians have found this fact difficult to square with Newton's apparent intellectual conservatism and his famous resistance to change in his scientific views and practices.[29] The result has been that when Newton's early Darwinism has been noted, it has usually been as a footnote to the story of his friend and colleague, Henry Baker Tristram, who, while converted to the cause by Newton in 1858, abandoned the theory after witnessing the Huxley–Wilberforce debate of 1860.[30]

Beyond this anecdote about Tristram, Newton's Darwinism has been dismissed as a paradoxical, vaguely interesting wrinkle in the career of an otherwise old-fashioned naturalist. While this is to a certain extent true, it is interesting to note the way Newton reconciled his belief in evolution by natural selection – within which extinction played a central role – with his effort to prevent extinctions resulting from human action by

28 Newton never tired of recalling his early conversion to Darwinism – going so far as to document the experience in an essay commissioned by *Macmillan's Magazine* in 1887. See Alfred Newton, 'Early days of Darwinism', *Macmillan's Magazine* (1888) 57(340), pp. 241–249. The commission itself was made on the basis of Newton's presidential remarks before the Biological Section of the BAAS in 1887, in which Newton strongly hinted at his own early role as a proponent of the theory of natural selection. See Alfred Newton, 'Address to the Biological Section', in *Report of the Fifty-Seventh Annual Meeting of the British Association for the Advancement of Science*, London: John Murray, 1887, 726–733.

29 Some contemporaries, including Newton's biographer, simply noted it. See Wollaston, op. cit. (9), p. 104. In an obituary in *The Ibis*, Newton was said to have accepted Darwinism because it 'went a long way towards solving his own difficulties'. Indeed, the author continued, Newton 'simply *adopted* the new philosophy, not being in need of *conversion*'. See 'Alfred Newton: Obituary', *The Ibis* (1907) 9th series, 1, pp. 623–633, 632. Emphasis original. Others have argued that age was determinative: Newton's generation was statistically much more likely to adopt the theory than was Darwin's own, as has been demonstrated in an exhaustive quantitative survey of reviews and reactions to the *Origin of Species* in contemporary journals. See Alvar Ellegård, *Darwin and the General Reader: The Reception of Darwin's Theory of Evolution in the British Periodical Press, 1859–1872*, repr. Chicago: University of Chicago Press, 1990 (first published 1958), esp. Appendix I, 'Statistical analysis of the press reaction', pp. 338–367. For a good summary of this topic in general see Peter J. Bowler, 'Scientific attitudes to Darwinism in Britain and America', in David Kohn (ed.), *The Darwinian Heritage*, Princeton: Princeton University Press, 1985, pp. 641–681.

30 For examples, see Archibald Geikie, 'Introduction', in Wollaston, op. cit. (9), p. ix; I. Bernard Cohen, 'Three notes on the reception of Darwin's ideas on natural selection (Henry Baker Tristram, Alfred Newton, Samuel Wilberforce)', in Kohn, op. cit. (29), pp. 589–608; and Richard England, 'Natural selection before the *Origin*: public reactions of some naturalists to the Darwin–Wallace papers (Thomas Boyd, Arthur Hussey, and Henry Baker Tristram)', *Journal of the History of Biology* (1997) 30, pp. 267–290.

distinguishing between what 'extinction' meant in both cases. The extinction central to natural selection was, not surprisingly, 'natural' in Newton's view, while human-caused extinction interfered with that natural process in deleterious ways. Newton used this distinction to delineate the boundary between proper and improper objects of protective legislation, which allowed him, in turn, to keep a handle on the fraught relationship between science and sentiment. Newton's 'conservative Darwinism' was tied up with his effort to understand the process of extinction in scientific terms and to fight to protect those animals suffering human-caused, rather than Darwinian, pressures.

Newton was famously conservative, in his politics and daily life as well as in his scientific work.[31] When given the chance to arrange his *Dictionary of Birds* according to a conceptual scheme, Newton restricted himself to alphabetical listing, deeming other systems overly speculative.[32] That Newton was such an 'old-school' zoologist, at a time when the 'experimental ideal' was on the rise, has led some to paint him as a stubborn traditionalist – an 'endangered species' in his own way.[33] To Archibald Geikie, a former student, the fact that Newton received 'with joy and admiration this momentous revolution in scientific thought' and 'actually made some effort to induce his brother naturalists to do likewise' was paradoxical.[34] Why, then, was Newton one of the first naturalists to take up Darwin and Wallace's theory of evolution by natural selection? The explanation for this seeming paradox lies in what evolution by natural selection did and did not do for Newton – how it proved useful for his scientific work, and how he was able to interpret it so as to interfere as little as possible with his conservative world view.

Significantly, what evolution did *not* do for Newton – unlike for many of his colleagues at Cambridge and elsewhere – was spur any theological or metaphysical doubts. Newton was a practising Anglican, proud of his impeccable attendance record at college services and virulently opposed to changes in chapel procedure.[35] In part, Newton was able to hold onto his belief while adopting a Darwinian framework by refusing to speculate on the theory's more troublesome implications, such as its application to human society. For a devoted adherent, Newton had surprisingly

31 According to Geikie, 'Newton was a strong Conservative, instinctively opposed to the abrogation of any ancient usage', a fact that helps explain his passion for encyclopedic work. Geikie, op. cit. (30), p. ix.

32 Alfred Newton, *A Dictionary of Birds, Volumes 1 & 2*, London: Adam and Charles Black, 1893–1896. For an argument that this evinced Newton's conservative intellectual bent see Wollaston, op. cit. (9), p. 108. It seems that Newton seldom speculated on theoretical issues: 'to matters of philosophical speculation it may be said that he was almost indifferent'. See Wollaston, op. cit. (9), p. 244.

33 For an example of a contemporary characterization, see [William Bateson], 'Professor Newton', Magdalene College Archives, University of Cambridge, Group F, Private Papers, F/AN. On Newton as an 'old school' zoologist, see Gerald L. Geison, *Michael Foster and the Cambridge School of Physiology: The Scientific Enterprise in Late Victorian Society*, Princeton: Princeton University Press, 1978, p. 119. The classic account of the rise of experimentalism in this period is Garland Allen, *Life Science in the Twentieth Century*, New York: Wiley, 1975, which builds on William Coleman, *Biology in the Nineteenth Century*, New York: Wiley, 1971. While Allen has since retracted the language of 'revolt', the general growth of what Coleman called 'the experimental ideal' has survived in the literature.

34 Geikie, op. cit. (30), p. ix.

35 Newton was famous for opposing 'alterations in the College dinner, the introduction of an organ into the chapel, the presence of ladies at divine service'. See Wollaston, op. cit. (9), p. 107.

little – indeed, nothing at all – to say about Darwin's own effort in this direction in his 1871 book on *The Descent of Man*. Indeed, Newton seems to have restricted himself to the theory's implications for non-human nature, a fact that speaks to his capacity to pick and choose from within the larger theoretical framework. Though Newton was present at the famous 1860 Huxley–Wilberforce debate, he did not seem troubled by the implications in this area drawn forth by the bishop, focusing instead on the theory's ability to explain perceived relations in non-human nature. Blinkered to the question of human ancestry, Newton came down firmly on the side of Huxley, describing Wilberforce's remarks in a letter to his brother as 'a wonderfully good speech … if the facts had been correct'.[36]

In terms of what evolution *did* do for Newton, a typical example of his published scientific work reveals one vector of the theory's impact. In an 1869 paper on avian osteology, consisting of an exhaustive morphological comparison of hundreds of bone specimens, Newton concluded that only common ancestry could make sense of certain observed similarities.[37] While the authors – Newton co-wrote the article with his brother – remained agnostic on the ultimate truth of natural selection, the theory provided the best means of collating their evidence:

> Whether this result can have been effected by the process of 'Natural Selection' must be regarded as an open question; that the Solitaire of Rodriguez and the Dodo of Mauritius, however much they eventually came to differ, sprang from one and the same parent stock, seems to us a deduction from the facts so obvious, that we can conceive no one fully acquainted with them hesitating about its adoption.[38]

The theory of natural selection served, in part, as a justification for the practices of traditional morphology in which Newton had been trained.[39] The intense anatomical scrutiny of museum specimens, sometimes for the purposes of classification but often with only minute description in mind, now had a new justification. According to Newton, such studies had been 'little more than the shuffling of cards, the ingenious arrangement of counters in a pretty pattern' before Darwin. Now, comparative morphology had become 'the serious study of the workings of Nature', the elucidation of the intricate process of natural selection.[40]

36 Alfred Newton to Edward Newton, 25 July 1860, published in Wollaston, op. cit. (9), p. 119.

37 Alfred Newton and Edward Newton, 'On the osteology of the solitaire or didine bird of the island of Rodriguez, *Pezophaps solitaria* (Gmel.)', *Philosophical Transactions of the Royal Society of London* (1869) 159, pp. 327–362. As was the habit of the Royal Society, a much shorter abstract was published in *Proceedings of the Royal Society of London* (Vol. 16 (1868), p. 428–433) prior to the full publication.

38 Newton and Newton, op. cit. (37), p. 358.

39 For further examples of Newton's work that support this hypothesis about the interaction of his Darwinism and traditional morphological practice see, among others, Newton, op. cit. (23); and *idem*, 'On existing remains of the gare-fowl (*Alca impennis*)', *The Ibis* (1870) 12(2), pp. 256–261. Peter Bowler has made a similar argument about the relationship between theory and practice in the work of Darwin himself. See Bowler, op. cit. (29), p. 655. On treating theory primarily as a framework for practices see Chris Renwick, 'The practice of Spencerian science: Patrick Geddes's biosocial program, 1876–1889', *Isis* (2009) 100, pp. 36–57, esp. n. 57.

40 Alfred Newton, 'Introduction', in *idem*, op. cit. (32), p. 79.

Beyond justifying the practices of natural history, Darwinism also furnished a new framework for natural knowledge itself. Newton insisted that natural selection provided him with 'an explanation of all the difficulties encountered in an honest attempt to understand the causes of a limited number of observed facts'.[41] As in the osteological study mentioned above, the principal of common descent was simply a 'deduction from the facts'; it provided a stable system of interlocking relations that could be mirrored in a new stability in the organization of natural-historical learning. According to the geneticist William Bateson, one of Newton's students, finding such a foundation was crucial for Newton: 'The collection and preservation of ornithological learning was his chief undertaking.'[42] The importance of organizing knowledge, and the role of Darwin in that organization, is clear in Newton's work on 'zoological regions' and their analogy to 'species'. Such concepts, he argued in 1887, were convenient names for complex processes of gradual chance. Each – 'species' and 'zoological regions' – was composed of 'a fauna which is, so to speak, a "function" of the period of its development'. The name pinpointed only a moment in the tide of natural events. 'One of the best tests of a biologist', Newton concluded, 'is his ability to talk or write of "Species" without believing that the term is more than a convenient counter for the exchange of ideas'.[43] Here we see that the gradualism and continuity over time built into Darwin's theory appealed to Newton's desire for stability in the organization of both nature and natural knowledge.

In these practical and conceptual aspects of his scientific work, and in the absence of the theological quandaries that beset some of his peers, we begin to see how Darwinism made sense for Newton. Even more important for our purposes, evolution shaped Newton's understanding of extinction. By affording a 'natural' explanation for extinctions that could not be attributed to human action, Darwinism gave moral force to Newton's pronouncements against extermination. The distinction was an important one: even a fervent Darwinian like Newton could adopt certain aspects of the theory without erasing the boundary between man and nature or abandoning the values, like stewardship, that governed it. In his article on 'The gare-fowl and its historians' he laid the blame for the great auk's demise not on the inherent unfitness of the bird, but rather on 'the merciless hand of man' – the extinction of the great auk was different, for Newton, from those for which Darwin's theory offered a viable explanation.[44] A newspaper summary of Newton's 1876 BAAS address captured this double vision perfectly: 'Nature, it may be admitted, is infinite in her variety, but, on the other hand, the number of existing types is daily diminishing.'[45] Darwinian extinction was a by-product of the origin of (new) species; when humans destroyed a lineage, nothing sprang up to replace it.

41 Newton, op. cit. (28), p. 249.
42 Bateson, op. cit. (33).
43 Newton 'Address to the Biological Section', op. cit. (28), 732–733.
44 Newton, op. cit. (23).
45 Editorial, *Daily Telegraph*, 19 September 1876. Copy in CUL, MS Add. 9839/5/1, 'Bird preservation' Volume.

For Newton, Darwinism was an acceptable explanation of the world precisely because the cases it explained were 'perfectly natural ones', and thus, he felt, 'must occur, have occurred, and possibly be occurring still'.[46] Human-caused extinction was not just a loss to the natural world; it was also a loss to science and to naturalists. Each lost animal was a hole in the potential storehouse of scientific knowledge, rendering the general understanding of the evolutionary process that much more difficult. In an 1876 address, Newton worked hard to blend science and sentiment by arguing that naturalists' feelings should be aroused by the endangerment of any creature through human action:

> There is no one species of animal whose structure and habits have been so completely investigated that absence of the means of further examination would not be a distinct deprivation to Science; and as what Science has done is only an earnest of what she will do, we cannot say that the time shall ever come when the want of those means will not be severely felt. It is then for scientific men, and for naturalists especially, to consider whether they are not bound, in the interest of their successors, to interpose more than they have hitherto given any sign of doing.[47]

For Darwinian naturalists, he suggested, such disruptions to the continuity of the grand processes of nature were also disruptions to the scientific learning process. Natural selection conferred harmony on both nature and natural knowledge. In terms of Newton's advocacy, it also provided a background explanation for 'natural' extinctions against which human-caused extinctions could be contrasted. Newton made this contrast explicit in a discussion of islands in his *Dictionary of Birds*: 'In them', Newton wrote, 'each species has long been brought into harmony with its circumstances, and relations with its fellow-creatures have so far become mutually adjusted that in the long run the balance between them is preserved' – until, that is, 'the appearance on the scene of man, and especially of civilized man, upsets the equilibrium'.[48] Natural selection produced variety only humans could destroy. Newton thus distanced himself from those fatalistic Darwinians who were 'content to let the dead bury their dead': by accepting a certain level of 'natural' extinction, he could distinguish, and rail against, human-caused extermination.[49] It is in this way that evolution shaped Newton's understanding of extinction, by enabling him to make a distinction he used to define both the ends and the means of animal protection for decades.

## 'Tempered by the naturalists'

Over the course of the 1860s, ornithologists began to call more frequently for legislative protection on behalf of certain avian species. Specialists pinpointed a specific set of historical causes: a burgeoning middle class with available leisure time increasingly turned to birding and bird-shooting for recreation just as technological innovations in firearms and transport became widespread, rendering flocks of nesting birds both closer

46 Alfred Newton to H.B. Tristram, 24 August 1858, quoted in Wollaston, op. cit. (9), p. 117.

47 Newton, op. cit. (4), p. 125.

48 Alfred Newton, 'Extermination.', in *idem*, *A Dictionary of Birds*, London: Adam and Charles Black, 1899 (original in 4 parts, 1893–1896), p. 215.

49 Alfred Newton, 'Mr. Grieve on the garefowl', *Nature* (8 October 1885) 32, pp. 545–546.

and easier targets. The specificity of these phenomena and the relative visibility of birdlife and its problems explain why birds were some of the first creatures afforded protection at a national level. While pressure was indeed on the rise in the mid-Victorian period, it should also be noted that Newton and his fellow ornithologists used rhetoric about such changes to protect not only birds, but also their own expertise on matters of extinction and protection. In particular, Newton was wary of having his movement to prevent extinction confused with other, older campaigns on behalf of animals, for reasons explained below.

Newton's advocacy was not without precedent – far from it. As James Turner, Harriet Ritvo and others have shown, there was a long tradition of British engagement with the animal world; perhaps most famously, the Royal Society for the Prevention of Cruelty to Animals (RSPCA) had been waging campaigns on behalf of domestic animals for half a century.[50] While the RSPCA was far from monolithic, and indeed called on sentiment in ways sometimes similar to Newton's own, he felt that their emphasis on suffering and appeals to sympathy blinded the public to more permanent consequences. Extinction (that is, human-caused extinction) was, for Newton, far more serious than cruelty, and he worked hard to disengage the issue of extinction from that of cruelty. Despite these efforts, historians of conservation have tended to flatten out this distinction, often treating Newton's campaign against extinction as a stepping-stone between better-known RSPCA campaigns against cruelty earlier in the century and campaigns against vivisection and the feather fashion later on.[51] As a result, important aspects of the relationship between science and sentiment in this period tend to disappear.

Paying attention to Newton's emphasis on extinction, on the other hand, helps brings the complexity of this relationship forward. Rare and endangered birds were both a scientific and a personal passion for Newton, though he was always careful to delineate between the two poles and to give precedence to his 'rational' interest. In his influential address, 'On the zoological aspect of the game laws', which he read before the BAAS in

50 James Turner, *Reckoning with the Beast: Animals, Pain, and Humanity in the Victorian Mind*, Baltimore: Johns Hopkins University Press, 1980; and Harriet Ritvo, *The Animal Estate: The English and Other Creatures in the Victorian Age*, Cambridge, MA: Harvard University Press, 1987. On the RSPCA in particular see Antony Brown, *Who Cares for Animals? 150 Years of the RSPCA*, London: William Heinemann Ltd, 1974. On Victorian philanthropy in general see F.K. Prochaska, *Women and Philanthropy in Nineteenth-Century England*, London: Clarendon Press, 1980; and *idem*, *The Voluntary Impulse: Philanthropy in Modern Britain*, London: Faber, 1988.

51 For example, see Robin Doughty, *Feather Fashions and Bird Preservation: A Study in Nature Protection*, Berkeley: University of California Press, 1975; Tony Samstag, *For Love of Birds: The Story of the Royal Society for the Protection of Birds, 1889–1988*, Sandy: The Royal Society for the Protection of Birds, 1988; Richard Clarke, *Pioneers of Conservation: The Selborne Society and the Royal SPB*, London: The Selborne Society, 2004; and Stefan Bargheer, 'The fools of the leisure class: honor, ridicule, and the emergence of animal protection legislation in England, 1740–1840', *European Journal of Sociology* (2006) 47, pp. 3–35. Even David Allen, who gives some attention to these matters, argues that 'the earliest cause' of bird protection 'was the finally unbearable scale of the destruction wrought by the latest fashion in women's hats'. See David Elliston Allen, *The Naturalist in Britain: A Social History*, Princeton: Princeton University Press, 1976, p. 177. One exception is Mark V. Barrow Jr, who dedicates a few pages of his recent monograph on the idea of extinction in America to Newton's efforts, mostly as a foil for the absence of an early response in the United States. See Mark V. Barrow Jr, *Nature's Ghosts: Confronting Extinction from the Age of Jefferson to the Age of Ecology*, Chicago: University of Chicago Press, 2009, pp. 65–66.

1868, he intimated that, 'with reference to sea-fowl, a certain amount of sentiment must be confessed'.[52] Newton was not opposed to sentiment – indeed, he later regretted that it was 'seldom that any one … feels the romance that clings around the history of an expiring race' – but felt that such feelings had to serve ends determined by scientific thought, rather than be allowed to roam free from such guidance.[53] In the case of extinction, as he understood it, the two worked in tandem: 'The regret with which I regard such extirpation is not merely a matter of sentiment', he declared in an 1876 address, adding, 'Here sentiment and science are for once in the same side. A heavy blow will be inflicted on Zoology by the disappearance of some of these marvellous and peculiar forms.'[54] Defined around extinction, animal protection might draw on science and sentiment simultaneously.

In 1868, Newton had hoped to rouse his audience to take up a protection movement defined around extinction; as it happened, a number of naturalists heeded his call. Responding to this interest the following year, the BAAS established a committee for the purpose of assessing 'the practicability of establishing "A Close Time" [a suspension of hunting, in this instance during breeding seasons] for the protection of indigenous Animals'.[55] This 'Close-Time Committee', as it became known, comprised pre-eminent naturalists like Alfred Newton, Canon Tristram, James Harting and Henry Dresser, each a member of one or more of London's most influential learned societies. The committee's strength came from its members' knowledge, influence and ostensibly apolitical interest in assessment. As Newton put it, the naturalist was a necessary intermediary between sentimental and economic interests: 'The officiousness of the one class and the slackness of the other must equally be tempered by the naturalists.'[56] Newton's claim that the scientific basis of bird protection and the committee's efforts in that regard were 'wholly unconnected with party politics' fit both the style of rhetoric typical of the British Association and a more general trend in the relation between politics and expertise in this period.[57]

Drawing on such apolitical rhetoric meant that, if the members of the Committee wanted to advocate as well as analyse, they would need to find an external body through which to do so. This they quickly did, in the form of the Association for the Protection of Sea Birds (APSB), a Yorkshire group that had emerged from a meeting

52 Alfred Newton, 'On the zoological aspect of game laws', in *Report of the Thirty-Eighth Annual Meeting of the British Association for the Advancement of Science*, London: John Murray, 1868, pp. 107–108.

53 Newton, op. cit. (49), p. 546.

54 Newton, op. cit. (4), p. 125.

55 *Report of the Thirty-Ninth Annual Meeting of the British Association for the Advancement of Science*, London: J. Murray, 1869, p. xlviii.

56 Newton, op. cit. (4), p. 125.

57 Newton, op. cit. (52), p. 108. The authoritative work on the founding and early mission of the British Association is still Jack Morrell and Arnold Thackray, *Gentlemen of Science: Early Years of the British Association for the Advancement of Science*, New York: Oxford University Press, 1982 – on its alleged apolitical nature see esp. p. 298. On the general history of the BAAS see Roy Macleod and Peter Collins (eds.), *The Parliament of Science: The British Association for the Advancement of Science 1831–1981*, Northwood: Science Reviews, 1981. On the relationship between politics and expertise in this period see Stefan Collini, *Public Moralists: Political Thought and Intellectual Life in Britain, 1850–1930*, New York: Oxford University Press, 1991, esp. p. 58.

in late 1868.[58] Henry Frederick Barnes, the vicar of Bridlington, had called the meeting to discuss the plight of seabirds at nearby Flamborough Head, whose decline had been pinned erroneously on local residents.[59] The real offenders, Barnes insisted, were 'parties of sportsmen from all corners of the Kingdom' who had been making excursions to slaughter birds for target practice since the 1830s.[60] He had called the meeting in the hope of securing protective legislation for the birds, and a number of local naturalists, including the local ornithological celebrity Francis Orpen Morris, turned out in support.[61] Looking to substantiate the APSB's claims with the expertise of influential naturalists, Barnes jumped at the chance to use Morris as a means of connecting his group to the recently established Close-Time Committee.[62] Both bodies benefited from their somewhat tacit collaboration, working together through correspondence on what would become Britain's first national legislation on behalf of non-game animals: the 1869 Sea Birds Preservation Act.[63]

The Act, like the movement that produced it, was not without precedent – indeed, Newton and the others consciously drew on a wide set of laws, both foreign and domestic, as they drew it up.[64] What set the Act of 1869 apart was the careful effort of its advocates to base their calls on unimpeachable ornithological evidence. When Tristram lamented 'the indiscriminate slaughter of predatory animals' in an 1867 address, he devoted much of his time to population and geographical data.[65]

58 Although Barnes would later change his name to Barnes-Lawrence under the conditions of an inheritance, Barnes is used here in order to reflect how he was known in this period.

59 John Sheail, *Nature in Trust: The History of Nature Conservation in Britain*, Glasgow: Blackie, 1976, p. 22.

60 See an account from the 1830s in Charles Waterton, *Essays on Natural History, Chiefly Ornithology*, London: Longman, 1839, p. 159.

61 F.O. Morris, to H.F. Barnes, 22 October 1868, Association for the Protection of Sea Birds, University of Hull Archives, Hull History Centre (Henceforth Hull-DSB), 1. Morris, already a famous naturalist who maintained his public image through an almost constant presence in ornithological journals and the popular press, was to become instrumental in the movement against the plumage trade at the end of the century.

62 For evidence of these efforts see H.H. Knocker to H.F. Barnes, 30 October [1868], Hull-DSB, 3; A. Newton to H.H. Knocker, 3 November 1868, Hull-DSB, 6; J.H. Gurney Jr to H.F. Barnes, 10 November 1868, Hull-DSB, 10; J. Cordeaux to [H.F. Barnes], 7 December 1868, Hull-DSB, 16.

63 The Act's precedence is framed in this way in Allen, op. cit. (51), pp. 176–177.

64 The list of precedents cited by the Committee is immense. Some, like domestic game laws, were seen as 'principles of privilege' and thus politically problematic. See *Report of the Forty-Third Annual Meeting of the British Association for the Advancement of Science*, London: J. Murray, 1873, p. 376. The anti-cruelty acts that resulted from earlier RSPCA campaigns were seen as more viable precedents, especially when they were justified in utilitarian terms. On the RSPCA's utilitarian language see Brown, op. cit. (50), pp. 14–15; and Doughty, op. cit. (51), p. 44. On the use of such language by scientists more generally see Lawrence Goldman, *Science, Reform, and Politics in Victorian Britain: The Social Science Association, 1857–1886*, Cambridge: Cambridge University Press, 2002, esp. Chapter 9. In addition to domestic laws, legislation from the Isle of Man and Newfoundland, as well as local acts from France, Germany and the United States, proved influential. See the *Report of the Thirty-Ninth Annual Meeting*, op. cit. (55), p. 92. On the role of international examples in British animal protection see Brian Harrison, 'Animals and the state in nineteenth-century England', *English Historical Review* (1973) 88, pp. 786–820, esp. 790. Christopher Sykes, the MP who introduced the bill, drew on similar language before Parliament. See *Hansard's Parliamentary Debates 194*, London: Cornelius Buck, 1869a, p. 406.

65 H.B. Tristram, 'On the zoological aspects of the grouse-disease', in *Report of the Thirty-Seventh Annual Meeting of the British Association for the Advancement of Science*, London: J. Murray, 1867, p. 97.

That address, 'On the zoological aspects of the grouse-disease', set the tone and, to a certain extent, the content of a more famous speech, 'On the zoological aspect of the game laws', delivered by Newton the following year. As their titles make clear, both addresses were self-consciously rooted in zoological study. To reaffirm the scientific, rather than sentimental, basis for their remarks, both men went out of their way to insist on the political infeasibility, and thus undesirability, of protecting problematic species like raptors or addressing thorny issues like habitat destruction due to agriculture.[66]

In the short run, seabirds proved less contentious. Threats to nesting populations of these birds by shooting parties led Newton to declare,

> The legislative appointment of a 'close time', to be proclaimed by the local authorities, during which the mere carrying of a gun should be an offence, is absolutely necessary. This plan has been adopted in several countries, including some of the most democratic, as shown by the Game Laws of Switzerland, Norway, the United States of America, and several British colonies.[67]

Newton closed his 1868 address by stating that, if naturalists did not insist on protection for seabirds during the breeding season, unpredictable changes would occur that would leave future naturalists resentful of the present generation's carelessness. Extinction, he insisted, was a tragic certainty if naturalists, the only group with the requisite knowledge, did not make the scientific case to back up the sentiment they shared with the public. The naturalists responded and, supplementing the heroic petitioning of Barnes and the APSB by acting as 'expert' lobbyists, were rewarded by a relatively smooth passage of the bill through both houses of Parliament and into law as the Sea Birds Preservation Act on 24 June 1869.

The public received the Act positively, and it was on the basis of this welcome reception that the Close-Time Committee decided to base all subsequent recommendations for the expansion of protection on its model.[68] Relying on a popular precedent would prove necessary, especially when the Committee began preparing a new bill for the protection of wading and shore birds in 1872, since including that class of birds would invite the enmity of a powerful upper-class constituency that viewed such measures with suspicion.[69] 'Beggars can't be choosers', Newton cautioned Barnes in

66 See, for example, Tristram, op. cit. (65), p. 97; and Newton, op. cit. (52), p. 107. This sort of demarcation also made its way into reports of the Close-Time Committee itself; see, for example, *The Report of the Forty-Fifth Annual Meeting*, op. cit. (4), p. 63. This question is also addressed in Donald Worster, *The Wealth of Nature: Environmental History and the Ecological Imagination*, New York: Oxford University Press, 1993, esp. pp. 156–170.

67 Newton, op. cit. (52), p. 108.

68 Of those who pushed for the Act of 1869, F.O. Morris was most public in his disappointment with the misjudgement of the close time. See F.O. Morris, 'Letter', *The Times*, 17 August 1885. Copy in CUL, MS Add. 9839/5/1, 'Bird Preservation' volume.

69 Opposition to the protection of wading and shore birds stemmed from their status as hunting quarries, since those classes that traditionally partook of the hunt tended to view that pursuit as a right, not a privilege. See H. Stevenson, 'Paper on the Wild Birds Protection Bill," *Norfolk Chronicle*, 5 April 1873.

1872, insisting that the language of the new bill needed to mirror that of the popular Act of 1869 in order to meet success.[70] Moderation was key, and, when a first draft of the new bill was completed, it was reportedly

> based entirely on the 'Sea-Birds' Preservation Act' of 1869, and, *mutatis mutandis* only, strictly followed the provisions of that Act, which experience has shown to have fully effected the object for which it was passed, and to have given very generally satisfaction to the country at large.[71]

The new shore birds bill, Newton declared, had 'pretty well [hit] the mean between extreme opinions'.[72]

What happened next made clear the boundary Newton perceived between proper and improper sentiment. While in committee, the radical MP Auberon Herbert proposed extending coverage to all wild birds, which rendered the bill, in the words of the Close-Time Committee, 'of general and indefinite scope'.[73] The ensuing debates highlighted an important distinction: some, like Herbert, were concerned primarily with cruelty against individuals, while others, like Newton and the Close-Time Committee, worried about extinction. The latter group perceived the efforts of the former as a threat to the establishment of a scientific basis for protection: 'Such an Act of Parliament', the Committee reported, 'is mischievous in its effect, since it diverts public attention from those species which, through neglect, indifference, custom, cupidity, or prejudice, are suffering a persecution that will in a few years ensure their complete extermination'.[74] As Newton put it, the question of cruelty was 'hardly connected with the preservation of birds and animals', and, if no threat of extinction could be proved, then protection was not warranted.[75] 'The crucial test of a species wanting protection', Newton later wrote, was 'whether its numbers [were] decreasing or the contrary' – and nothing more.[76]

## 'A reasonable state of things'

Newton's convictions about the relationship between science and sentiment led him to lash out in earnest when he felt unchecked sentiment was undermining the proper, scientific basis of protection. When a push to protect 'small birds' emerged in the years after 1869, Newton reacted violently, declaring the effort a 'mistaken and mischievous'

70 A. Newton to H.F. Barnes, 15 February 1872, Hull-DSB, 169. For further evidence of Newton's conservative strain of thought as regards expansion of the Act see his related letter to Barnes: A. Newton to H.F. Barnes, 10 February 1872, Hull-DSB, 167. The point was reiterated to Barnes by others; see, for example, J.E. Harting to H.F. Barnes, 15 January 1872, Hull-DSB, 168.

71 *Report of the Forty-Second Annual Meeting of the British Association for the Advancement of Science*, London: J. Murray, 1872, p. 320.

72 A. Newton to H.F. Barnes, 27 February 1872, Hull-DSB, 172.

73 *Report of the Forty-Second Annual Meeting*, op. cit. (71), p. 320.

74 *Report of the Forty-Second Annual Meeting*, op. cit. (71), p. 322.

75 Alfred Newton, op. cit. (5).

76 [Newton], '1. Report on the practicability of establishing 'A Close Time' for the protection of indigenous animals, by a Committee appointed by the British Association, 1869–1880.'

cooption by the 'sentimental party'.[77] In a letter to his brother, Newton put it in even stronger, and more colourful, terms:

> No ornithologist whose opinion could carry the slightest weight appears to have been consulted, and no ornithologist was among the twenty-three members forming the Select Committee. Mr. Herbert laid a cuckoo's egg in the carefully-built nest of the British Association Committee, and the produce is a useless monster – the wonder alike of the learned and the layman, and an awful warning as an example of amateur legislation.[78]

Here, Newton revealed not only his ire but also his assumptions about the role of expertise in producing effective legislation. He reserved special derision for the Parliamentary Select Committee on Wild Birds Protection convened in 1873, complaining in a history he wrote for the *Quarterly Review* in 1881 that the quality of its witnesses – 'ornithologists, pseudo-ornithologists, farmers, gardeners, bird-catchers, and others' – varied widely, and lambasting the committee for examining the secretary of the RSPCA instead of Henry Dresser, the secretary of his own Close-Time Committee, 'who was especially known to have a thorough acquaintance with the laws and regulations on the subject existing in other countries'.[79]

Although 'it was no fault of the gentlemen composing it that they knew not what questions to ask, and were unable to discriminate between the knowledge and the show of knowledge possessed by the witnesses examined', Newton's message was clear: naturalists alone knew the precise cause and probable cure for nature's ills. As Newton told it, neither prior agitation against cruelty nor the opinions of philanthropists, farmers, or any other group were to thank for the successes of the movement. Rather, as Newton put it in the conclusion of his anonymous *Quarterly Review* piece,

> Most praise of all, however, should rest upon the Close-Time Committee of the British Association. Between the ultra-sentimentalist on the one side, and the all-destroying on the other, while beset all round by persons whom we can scarcely refrain from terming quacks, that Committee has had no easy task; but the practical as well as scientific knowledge of its Secretary, Mr. Dresser, seems to have been equal to every emergency that arose. Thus, though not always victorious, that Committee has very effectually conduced to a reasonable state of things, with which all men may for the present be content.[80]

While the secretary of the RSPCA could offer advice on anti-cruelty advocacy, these concluding words make clear that Newton had shaped the animal protection movement in such a way as to position the men of the Close-Time Committee – including himself – as its natural leaders. By turning extinction into an object of scientific study and shaping the animal protection movement around it, Newton helped to crystallize the concept of extinction and the form of animal protection with which we still operate today. What is more, his insistence on a particular balance of science and sentiment, and on a place for naturalists at the boundary between the two, reveals a moment in which the cultural authority of science and the values underpinning it were still very much up for grabs.

77 *Land and Water*, December 1884. Copy in CUL, MS Add. 9839/5/1, 'Bird Preservation' volume.
78 A. Newton to E. Newton, 10 July 1872, in Wollaston, op. cit. (9), p. 141.
79 [Newton], op. cit. (76).
80 [Newton], op. cit. (76), p. 114.

As I have argued, that moment is captured perfectly in the concept of extinction as developed by Newton. What I have shown is how a fundamental aspect of our knowledge of the natural order coalesced in a particular Victorian context. The strands leading into Newton's understanding of extinction – including a vision of the balance between science and sentiment, as well as a selective appropriation of Darwinian natural selection – reflect the ideas and values of his age. While this is partly about the genesis of an important idea, it is also about 'the uses of extinction', to borrow a phrase of Gillian Beer's.[81] In a recent article on the subject, Beer argues that Darwin and his early followers were much more sanguine about extinctions than we are today. For them, it was a necessary fact of life, one essential to the diversification of those 'endless forms most beautiful and most wonderful' about which he wrote with such apparent rapture. Today, by contrast, we have trouble seeing past our own destructive hand in the matter. Beer goes on to suggest that 'perhaps we need to recognize that extinction is humdrum and persistent *as well as* being an extreme event' – that extinction has a dual identity as both a tragedy and a commonplace.[82] It is a welcome intervention, but it fails to see that the concept's early elucidation was bifurcated in precisely this way. Extinction was not welcomed and then subsequently lamented: its early definition accommodated both reactions, a fact we lose sight of unless we attend on the concept's complex history.

For Newton, there were a number of 'uses of extinction'. For one, Darwinian natural selection helped naturalize certain animal disappearances, allowing Newton to define human-caused extinction as 'unnatural'. Without an explanation for extinctions in which humans played no part, Newton would have been hard pressed to moralize about those that stemmed from human action. Defining extinction as an 'exterminating process' that could be studied scientifically, Newton carved a space for naturalists like himself within the nascent state-based animal protection apparatus. In this sense, extinction, as a concept, served the interests of naturalists and nature alike: expertise in a process operating at the human/nature boundary became a prerequisite for policing it. A newspaper summarized Newton's view: 'our interference is at present so fatal that further interpositions of another kind are required as a counterbalance; while that counterbalance science only can supply'.[83] To maintain the balance of nature, advocacy itself had to be balanced – it had to be, as Newton put it, 'tempered by the naturalists'.[84]

Newton drove home this need for balance, and the related need for scientific knowledge, in his 1876 address: 'We can only govern Nature by obeying her, only by obeying her can we assist her', he said, adding, 'To obey her laws we must know them; what can we know of them but what Science teaches us?'[85] Knowledge of the complex workings of the natural world was the only way to ensure nature's protection – to fight extinction, one had to know it. Such knowledge, like the theory of natural selection,

81 Gillian Beer, 'Darwin and the uses of extinction', *Victorian Studies* (2009) 51, pp. 321–331.
82 Beer, op. cit. (81), original emphasis.
83 Editorial, *Daily Telegraph*, 19 September 1876.
84 Newton, op. cit. (4), p. 125.
85 Newton, op. cit. (4), p. 123.

turned some into fatalists about animal endangerment.[86] Not so for Newton. He concluded his 1876 address on a hopeful note:

> It may be said that I have taken too gloomy a view of this matter of the extirpation of animals by man. I wish I could think so. But I believe that if we go to work in the right way there is yet time to save many an otherwise expiring species.[87]

Accepting ubiquitous change – even extinction – was not a prelude to pessimism. Rather, Newton felt that naturalists should call on their unique familiarity with such processes to engage the sentiments of the wider public. By simultaneously defining animal protection as a movement against extinction and defining extinction as a process to be studied scientifically, Newton joined science and sentiment in a way that continues to hold sway in the environmental movement today.

86 For an example of this sort of fatalism see Robert Gray, 'Notes on the occurrence of the great auk in Scotland', in *idem*, *The Birds of the West of Scotland, Including the Outer Hebrides, with Occasional Records of the Occurrence of the Rarer Species throughout Scotland Generally*, Glasgow: T. Murray and Son, Edinburgh, 1871, p. 13.

87 Newton, op. cit. (4), p. 125.