

*Chapter 2*

## Visualizing Extinction

Harriet Ritvo in Conversation

*Harriet Ritvo*



**Valérie Bienvenue:** You recently published a series of short essays under the title ‘Extinction’ for the Visualizing Climate and Loss project hosted by the Harvard Center for History and Economics.<sup>1</sup> The essays obviously form part of a broader project of ‘visualizing’, but can you tell me a little about what informed your own decisions in terms of envisioning extinction? You focus, for example, predominantly on mammals although you also write about the dodo. The mammoth became extinct in prehistory, but others much more recently. Some other mammals such as the bison, the red squirrel and the tiger are not yet extinct. Several of the extinct, such as the dodo, the quagga, and the thylacine have become iconic. What rationales underpin these specific choices, which seem consciously wide-ranging but, for example, avoid plants (although you have discussed flora in your work in the past)?

**Harriet Ritvo:** The Visualizing Climate and Loss website understands its subject very expansively, and its audience is imagined with similar generosity. It describes itself as ‘a platform for thinking with history about change, loss, and daily life – and for thinking about what is to be done’. Since loss (as opposed to extinction) is subjective, in choosing examples I tried to represent a range of human interactions and human responses. All the species that I discussed have inspired significant human interest, whether synchronous or retrospective, as well as the desire, depending on particular circumstances, to protect, lament or reconstitute. The preponderance

of mammals reflects the human tendency to respond most strongly to the animals that seem closest to us, not just taxonomically or phylogenetically, but also chronologically. For example, the *T. rex* (along with many other dinosaurs) has inspired a great deal of interest among both specialists and members of the general public since its discovery over a century ago. But *Jurassic Park* to the contrary notwithstanding, that fascination has seldom been expressed in the context of nostalgia or regret.

The only non-mammal included in 'Extinction' is the dodo, a bird that very few humans ever observed alive, as it survived for less than a century after Dutch sailors had noted it on the island of Mauritius, to which its range was restricted. Indeed, relatively few people even observed it dead, and the (partial) specimen preserved in the Oxford Museum of Natural History includes the only remaining bits of dodo soft tissue. (Dodo bones have recently become somewhat less scarce, as a trove of them was excavated from an ancient swamp in 2019, along with the bones of other extinct Mauritian animals.) The relatively high profile of the dodo has thus reflected its symbolic or representational presence, rather than remembered interaction or deeply felt loss; especially since the appearance of John Tenniel's image in *Alice's Adventures in Wonderland* (1865),<sup>2</sup> the dodo has tended to evoke laughter as well as loss.

It has always been understood that dodos disappeared as a result of their contact with humans, an experience that links them to almost all of the other animals discussed in 'Extinction'. The only possible exception is the mammoth, which disappeared much earlier than the others, although not before it had coexisted with our species for thousands of years. The cause of its extinction, along with that of many other large mammals, around the end of the last Pleistocene glaciation (although an isolated population survived on Wrangel Island until about 3,700 years ago), remains the subject of controversy, with human agency and climate changes as the likeliest – and not mutually exclusive – explanations. Like many controversies, this one reflects current politics as well as current science. The demise of the aurochs can be dated with unusual precision to 1627, because the only remaining individuals had previously received a degree of royal protection, although, as with many species currently on the brink of extinction, evidently not enough. In the nineteenth century there was some confusion about whether the extant European bison was in fact the aurochs (it was not); subsequently the aurochs has emerged as the symbol of a vanished Europe. The quagga of southern Africa and the American bison had both been numerous at the beginning of the nineteenth century, and both approached extinction after 1860 for similar reasons – human exploitation and human expansion into their habitats. The quagga disappeared without inspiring much regret; one indication is that although several of them

were displayed in European zoos, and of course many died in their native range, very few skeletons or hides have been preserved in museums. The American bison, because of its iconic status, was the subject of one of the most successful rescue efforts, and became the national mammal of the United States in 2016 (the bald eagle, saved from extinction more recently when DDT was banned, remains the national bird of the United States). By the time Europeans began to settle Australia, the mainland thylacines had disappeared; the only surviving population inhabited the southern island of Tasmania. They met the fate that has often awaited predators who share (or who are imagined to share) the same hunting predilections as humans. They received official protection in 1936, a few months before the last-known individual died in the Hobart Zoo; Tasmanians have subsequently embraced the thylacine as their mascot. Tigers are not yet extinct, although human hunting and habitat encroachment have greatly reduced their wild populations from historical levels; more of them live in captivity outside South Asia than roam free within it. Even the few remaining tigers spark the desire to eliminate competition that led to the extinction of the thylacine, and to attempts, often officially sponsored, to eliminate wolves, wolverines and other carnivores. The British red squirrel is not particularly British, and it is not endangered or even threatened over most of its large Eurasian range. But in Britain it has been pushed to Scotland and the extreme north-west of England as a result of competition with the grey squirrel, introduced from North America, which also carries a disease that is lethal to the red squirrels.

**VB:** Linked with the question of the animals that you discuss in ‘Extinction’, in your book *The Dawn of Green*<sup>3</sup> you note in the context of a discussion of Cumbrian fauna that ‘large mammals tend to be the most compelling representative of nature, wild or otherwise’. The same could also be said of large mammals in relation to the representation of extinction. Your absorbing and persuasive discussion of the British red squirrel (a relatively small rodent) shows, however, that tendencies in terms of what is seen as compelling are not inevitabilities.

**HR:** Humans tend to feel the strongest connection to the other animals that they resemble most closely, which is why we are more likely to mourn (and indeed to notice) the diminution or disappearance of large to medium-sized mammals than those of other creatures. But as has been the case with the dodo, metaphor or metonymy can lend less impressive creatures a figurative cachet disproportionate to their size. Thus, the red squirrel’s prominent place in British affections owes much to Beatrix Potter’s *The Tale of Squirrel Nutkin*,<sup>4</sup> which chronicles the close escape (with his life but not

his tail) of the cheeky title character. He has become so widely appreciated in his native country, as well as in some other places, that when, in 2006 (long before Brexit) the UK Heritage Lottery Fund awarded £626,000 to protect what supporters affectionately termed ‘the real Squirrel Nutkin’, the grant drew praise from across the entire political spectrum – not just the mainstream parliamentary parties, but also the (self-described) ‘patriotic nationalist’ British National Party (BNP).

**VB:** Coming back to the British red squirrel, you note that the extremist BNP supports efforts to protect the squirrel as part of ‘Britain’s iconic wildlife’. In this instance, a locally endangered species becomes bound up with issues of national identity and nationalism. The politics of national identity (such as the national bird of the United States that you mention, the bald eagle) and regional identity (such as the extinct Honshu wolf), as they are played out through specific animal species, invites reflection on how animal conservation and animal imagery can be co-opted to serve nationalist ideologies. You gesture towards this phenomenon in your discussion of the American bison which, as you note, has been signed into law as the ‘national mammal’ of the United States. But can you say a little more about the history of nationalism as it intersects with animal histories?

**HR:** It turns out to be difficult to disentangle natural history from politics. The overlap is manifest in book titles like *The Breeding Birds of Quebec*<sup>5</sup> and *Guide to the Mammals of Pennsylvania*,<sup>6</sup> where political boundaries implicitly substitute for the limits of natural ranges, and in the characterization of animals like the red squirrel as extinct in a specific nation or province, when the same species is thriving elsewhere, often quite nearby. It has deep historical roots. For example, the British naturalist Thomas Pennant lamented in a preface of 1784, soon after the conclusion of the American Revolution: ‘[T]his Work was designed as a sketch of the Zoology of North America. I, though, I had a right to the attempt, at a time I had the honor of calling myself a fellow-subject with that respectable part of our former great empire; but when the fatal and humiliating hour arrived, which deprived Britain of power, strength and glory . . . I could no longer support my clame [*sic*] of entitling myself its humble zoologist’. (George III could not have expressed himself with deeper feeling; Pennant published his survey under the title of *Arctic Zoology*,<sup>7</sup> an acknowledgment of Britain’s remaining North American possession.)

Animals have often served as national symbols, whether designated by a legislature or sanctified by tradition. Animals selected for this purpose, like those chosen as mascots for sports teams, are usually large or aggressive or both; the kangaroo and emu who support the shield on the Australian

coat of arms are unusually pacific (if relatively large). Like the British lion, such symbols do not need to be native to the nation that they represent – indeed, like the British unicorn, they do not even need to be real – but native animals turn out to be more resonant with nationalist ideologies. The most striking twentieth-century example of this resonance was the desire of some German zoologists and politicians to resurrect the vanished aurochs (the ancestor of all domesticated cattle), which they understood as the representative of a wilder, stronger, nobler, and purer Europe. In the 1920s and 1930s, the brothers, Heinz and Lutz Heck, both zoo directors, produced factitious aurochs by ‘breeding back’ from various European cattle breeds that possessed characteristics that they identified as primitive. The symbolism surrounding this effort was readily incorporated into Nazi ideology, and Hermann Goering dreamed of introducing aurochs into the forests of eastern Poland, to supplement their extant native deer and elk. Descendants of these Heck cattle still survive, mostly standing in for their Pleistocene forebears in attempts to reconstitute ancient landscapes, such as Oostvaardersplassen in the Netherlands. Nevertheless, some of their original aura apparently remains; when an English farmer imported a small herd of them in 2009, they were attacked in the media as Nazi cows. A more recent attempt to recreate the aurochs – one that is continental rather than national – has been undertaken by the Taurus Foundation, which has successfully introduced its breed of *Taurus* cattle in several European national parks.

**VB:** I’m really glad you brought up the Oostvaardersplassen. As you know, there’s been considerable controversy about this effort at ‘rewilding’. In 2018, the Staatsbosbeheer (the forestry commission) shot hundreds of animals, including Heck cattle, that were dying of starvation after a harsh winter. The carcasses were left in situ to simulate natural processes. The sight of dead and emaciated deer and cattle disturbed visitors and led to protests. Is the modern vision of nature too tame to embrace the harsh realities that accompany ‘rewilding’ initiatives such as the Oostvaardersplassen? Or is ‘rewilding’ itself a misnomer? Is ‘wilderness’ readily geographically and historically transplantable? I’d be interested to hear your views.

**HR:** Wilderness, whether reconstituted or not, turns out to be elusive. As William Cronon persuasively argued several decades ago in his essay, ‘The Trouble with Wilderness; or, Getting Back to the Wrong Nature’,<sup>8</sup> neither the idea of wilderness nor its material embodiments exist outside the sphere of human culture and human influence. Most rewilding efforts aim to restore a set of pre-existing – usually pre-agricultural – conditions. But it is always difficult to decide exactly which conditions should be the tar-

get, as pre-agricultural environments were not static (the somewhat misleading implication of terms like ‘climax forest’), but altered in response to changes in climate and in the distribution of plant and animal species. Such attempts to recreate previous ecosystems, like attempts to preserve those in national parks and similar spaces, also have to confront the constant impact of a variety of anthropogenic influences, including, but not limited to, the ubiquitous presence of humans. The public response to the dead deer and cattle at Oostvaardersplassen, and the reluctance of the reserve managers to let them die ‘natural’ if painful deaths from exposure and starvation, suggest that at least some people have become reluctant to confront the most troubling aspects of the experience of wildlife. The absence of large predators from the reserve implicitly makes a similar point, as well as suggesting an explanation for the overpopulation of ungulates that led to this crisis. But the frequent scenes of struggle and death in nature documentaries make a rather different point about contemporary sensibilities.

**VB:** The devastating effects of overhunting, the hunter as a recent agent of extinction, is a theme in your article ‘Animal Planet’,<sup>9</sup> and one you also explore in *The Animal Estate*.<sup>10</sup> Hunting for sport was common among colonialists. The hunting trophy (the head or skin) confirmed humans in their position of superiority over other creatures. Nowadays, hunting as a pastime is less common (although still popular, for example, here in Quebec) and sometimes openly criticized. Are there equivalent contemporary practices that now work to secure humans as the ‘top animals’? In ‘Animal Planet’,<sup>11</sup> for instance, you mention photographers as ‘hunters transformed to suit modern sensibilities’. Are contemporary efforts to depict and document animals sometimes motivated by a need for mastery as much as a drive to know and understand? Can the two motivations be separated?

**HR:** Hunting remains popular in many places, and many hunters continue to be advocates of wildlife protection, as they have been since the late nineteenth-century origins of the wildlife conservation movement, although their ultimate agenda differs somewhat from that of many environmentalists. This trajectory can be seen in the history of the NGO charity Flora and Fauna International, which defines its current focus as ‘protecting biodiversity . . . which underpins healthy ecosystems and is critical for the life-support systems that humans and all other species rely on’.<sup>12</sup> It was founded in the early twentieth century by a group that included big game hunters as well as naturalists (then as now, not mutually exclusive categories) as the Society for the Preservation of the Wild Fauna of the Empire. It has borne a series of names in the intervening century, mirroring shifts in the politics of wildlife conservation. In 1978, when the



society published a brief history to commemorate its seventy-fifth anniversary, its name was the Fauna Preservation Society, and the book's title was *The Penitent Butchers*.<sup>13</sup>

The association between traditional hunting and its spectatorial analogue is also evoked by the phrase 'with gun and camera', which has often appeared in the titles of narratives of big game hunting. When travellers confine themselves to the camera, the trophies that they bring home are different, although, depending on the skill and reflexes of the photographer, they may nevertheless suggest the appeal of violence, albeit violence inflicted without human intervention, and therefore as a result of competition or predation that would presumably have happened whether or not humans had observed and documented it. Like the readers of these narratives, contemporary viewers also seem to relish animal combat and death. In consequence, wildlife documentaries routinely feature scenes (occasionally, if surreptitiously, staged) of struggle and predation, although (non-documentary) movies that include such scenes normally include the disclaimer, conferred by American Humane (formerly the American Humane Association), which has a contract with the film industry, that 'No Animals Were Harmed in the Making of This Film'.

**VB:** 'Extinction' is generously illustrated and includes numerous reproductions of artworks, artefacts and photographs to represent or visualize the animals you discuss. In the case of the dodo, you note that recent scientific investigations have shown that the plump animal represented in many artworks and models does not match the bird's real appearance, which was likely far thinner. This caused the Oxford Museum of Natural History to revise its display. In *The Platypus and the Mermaid*,<sup>14</sup> you also reproduce an engraving of two marsupials (the thylacine and the Tasmanian devil), which were drawn and named to resemble other carnivores, a dog and a bear respectively. These too are not anatomically correct – yet, like the fattened dodo, the 'errors' in their portrayal seem useful historically as an index to European attitudes and ideas regarding these animals. As a historian, how do you approach visual representations of animals from the past, extinct or otherwise? What is their status as historical evidence? Should their perceived inexactitudes be dismissed as 'bad science' or now considered alongside contemporary visions of the animals for the insights they can provide about feelings and viewpoints in the past?

**HR:** Albrecht Dürer's famous image of an armour-plated rhinoceros, based on a written description of a living one that had been displayed in Lisbon (so that at least the description was based on actual observation) exemplifies the challenges that European naturalists encountered in re-

constructing the likeness of a living animal from a combination of organic remains and the accounts of travellers. Whether preserved in the form of dried bones and skins, or (at least for smaller creatures) suspended in alcohol solutions, shape, colour and size were likely to alter in transit. It was often not possible to tell whether the specimen was male or female, juvenile or adult. And interpretation of remains often reflected speculations or assumptions about which more familiar animals the exotic specimen was related to. Thus, the American opossums that were transported to Europe, some living and some preserved, beginning in the late fifteenth century, were variously compared to foxes, bats and apes, depending on which body part was considered to be diagnostic. The pouch was noticed, but it was not recognized as significant until centuries later, when naturalists encountered many more pouches among the Australian fauna. In addition, it was not always clear that specimens were genuine or that descriptions were credible. For example, mermaids composed of the front end of a monkey and the back end of a salmon surfaced repeatedly well into the nineteenth century. Such constructed creatures inspired the scepticism that caused George Shaw, who published the first scientific description of the platypus, to attack the specimen that arrived at the British Museum in 1799 with scissors, on the grounds that the bill must have been sewn on.

Occasionally, as on the voyages of Captain Cook, the collectors and observers were expert naturalists, and so the specimens, descriptions and images they sent back were especially accurate and reliable; however, more often this was not the case. In the mid-nineteenth century, therefore, the British Association for the Advancement of Science published guidebooks designed to encourage the colonial officials, military officers, and other amateurs who might find themselves in exotic locations, to record their observations and collect their specimens in the ways that would be most useful to metropolitan naturalists.

The difficulty that experts had in interpreting the results of amateur observation and collection was not confined to other species. Thus, beginning in 1874, and with editions continuing to appear into the twentieth century, the British Association for the Advancement of Science published the conveniently pocket-sized *Notes and Queries on Anthropology*,<sup>15</sup> the object of which was to 'promote accurate anthropological observation on the part of travellers, and to enable those who are not anthropologists themselves to supply the information that is wanted for the scientific study of anthropology at home'.

However inaccurate or misguided they may seem from the perspective of current zoology, such inexpertly produced images offer significant evidence about the availability of evidence in earlier periods, as well as about the underlying assumptions and understandings that conditioned the in-



interpretation of that evidence. Since science is an evolving and collaborative enterprise, expert consensus routinely changes in response to increasing information and evolving theory. Superseded interpretations should be evaluated by the standards of their own time, rather than by those of later periods. (If people cling to such interpretations long after they have been definitively superseded, then the judgement of ‘bad science’ might be appropriate.)

**VB:** You have written extensively about animals in history, and your essays here can be seen as a continuation of that work. Is there, however, a difference in how you approach writing about extinct animals? Are there specific historiographic challenges that come with writing about animals that, like the past itself, are now only accessible by way of representation?

**HR:** I think that your question contains its own answer. The sources of information about extinct species are different (and less abundant) than the sources of information about extant ones; similar distinctions exist between sources of information about rare species and common ones, and between sources of information about wild species and domesticated ones. Indeed, the fact that most domesticated species have received their own species-level taxonomic designation, even though they continue to interbreed successfully with their wild ancestors (if they are not extinct) is an indication of the relative intensity of our connection with them. In general, for species whose relationship with humans has been infrequent or non-existent, sources tend to be scientific – whether archaeological, palaeontological, archaeozoological or zoological – rather than conventionally historical or literary or artistic. This means that humanists sometimes need to interpret them through the lens of an intermediate contemporary discipline, and sometimes, adding an extra layer of complexity, through an earlier version of such a discipline.

**VB:** It sounds like historians who study animals, extinct or otherwise, frequently need to adopt a qualitatively different approach to their research compared to historians who limit themselves to human history, because the sources of evidence are different. ‘Animal history’ is becoming an accepted subfield in history. How do you understand that term? Is it helpful to distinguish history about animals from other kinds of history? Do you view your own work as ‘animal history’?

**HR:** It depends what you mean by animal history. As historians have increasingly recognized the importance of integrating non-humans into their accounts, other animals have been mainstreamed into works that

would be categorized as social history or cultural history. But there are also many historians who focus primarily on other animals. Because of the nature of the historical record, both groups primarily depend on sources produced by people. And even non-written sources, such as those provided by taphonomy, rarely offer direct insight into the experience of the original possessors of the bones. Of course, the same sources can yield a variety of insights, depending on the perspective from which they are interrogated. A further challenge to animal historians is how to integrate the insights from zoology, ethology and animal behaviour studies into their work. History is not the only discipline that has increasingly acknowledged the importance of other species. Most of the disciplines in the social sciences and humanities now include animal-related essays in their journals and animal-related panels in their conferences. In addition, there is a very lively interdisciplinary field called animal studies, which overlaps to some extent but not completely with scholarship in the standard disciplines. It is closest in spirit to cultural studies and philosophy.

**VB:** Coming back to extinction, the idea of de-extinction is much debated. As you note, the availability of frozen woolly mammoth DNA has generated the desire to create artificial worlds such as the Pleistocene Park in Siberia – a project with echoes of Steven Spielberg’s fictional *Jurassic Park*. There have also been efforts to clone a thylacine; and the Quagga Project, while having perhaps less ‘spectacular’ aspirations to the Pleistocene Park, can also be seen as symptomatic of a wish to make good the loss of a species. How do you think these efforts to undo past actions and events should be understood? Are these projects about refusing loss, advancing science, providing entertainment, or something else altogether?

**HR:** As you suggest, the motivations behind de-extinction are extremely varied, from the sentimental and frivolous, to the environmental and scientific. In *How to Clone a Mammoth: The Science of De-Extinction*,<sup>16</sup> biologist Beth Shapiro expansively defines her perspective as that of an ‘enthusiastic realist’. She says: ‘I believe that de-extinction is in many cases scientifically and ethically unjustified. However, I also believe that de-extinction technology has great potential to become an important tool for conserving species and habitats that are threatened in the present day’. The quagga is a promising target for de-extinction on several grounds. It is so similar to the still numerous Burchell’s zebra that they have recently been reclassified as belonging to the same species. Thus, when Lutz Heck visited its former range in southern Africa after the Second World War, he suggested that the same back-breeding techniques that he had used in his quest to reconstitute the aurochs might also revive the quagga. Several decades later his

suggestion was implemented by the Quagga Project, and they have managed to produce zebras with noticeably reduced striping.

Of course, opinions vary about exactly what has been achieved and how good it is, let alone about whether it should have been attempted in the first place. For example, the Grant Museum of Zoology in London, which owns one of only seven extant quagga skeletons, calls the project ‘extremely controversial’ as ‘the result wouldn’t actually be a quagga genetically, it would just be a plains zebra artificially selected to look like one’.<sup>17</sup> It then suggests an alternative means of resurrection: ‘to extract DNA from bone marrow and remaining taxidermy specimens and use it for cloning by injecting this DNA into a zebra egg’<sup>18</sup> (you can see why the Quagga Project may have chosen the low road). But quagga advocates are not dismayed by such punctiliousness and scepticism. In a sense they are beside the point – that is, they don’t address the fundamental impulse or perhaps the fundamental longing that motivates many de-extinction endeavours. As an American commentator for the Nature Conservancy put it, after admitting all the scientific problems, herds of resurrected semi-quaggas offered ‘inspiration’ and ‘hope’; seeing them ‘did not seem terribly different from seeing bison on a private ranch, or black-footed ferrets that had been introduced after captive breeding’.<sup>19</sup>

**VB:** In your Introduction to ‘Extinction’<sup>20</sup> you draw attention to aspects of extinction that do not create consensus. You suggest that even if the dominant narrative of the disappearance of the dinosaurs has mainstream acceptance, certain institutions such as the Creation Museum in Kentucky offer an alternative timeframe for it. In an era when ‘alternative facts’ are given significant media attention, and objective standards for truth are frequently ignored (e.g. climate change science), the stakes involved in ‘visualizing climate and loss’ seem particularly high. What strategies do you think scientists and historians need to adopt to resist attacks upon their knowledge and understanding of environmental concerns, including the interrelated issues of extinction and global warming? Should we be striving for greater dialogue across the humanities and natural sciences now that intellectuals across all disciplines seem subject to vitriol and mistrust?

**HR:** The current climate of mistrust of expertise has unfortunately been conspicuous in responses to the coronavirus pandemic, as well as, previously, in resistance to vaccinations, and rejection of the evidence for climate change and evolution. It is very troublesome to see facts discussed and queried as if they are opinions – although, of course, not all opinions are equally debatable or equally well grounded. As a faculty member at MIT, I have taught a range of undergraduate classes in which most of students

were science or engineering majors. One issue that inevitably arises, no matter whether the topic of the class is British history or the relationships between humans and other animals, is how to evaluate interpretations (or, to put it a different way, why one should not dismiss anything that is not clearly a fact). Dialogue across the humanities and natural sciences always seems to be a good thing, but I am not sure that it is the remedy for the very widespread and profound rejection of intellectual authority that features constantly in the news. Although there are exceptions in both groups, most humanists and scientists respect the expertise of other disciplines. In a way, the problem may lie with the recently prominent denotation of 'elite', the connotation of which invites resentment whatever it denotes, to refer to people with greater access to information, rather than to people with more money or elevated status. The challenge, then, would be to convert information from a perceived threat to a perceived benefit.

**VB:** Thank you, Harriet. It's been a great pleasure for us to talk together.

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## Notes

1. (VB) This conversation was conducted by email from 28 November 2019 to 31 August 2020. All notes are my own. Ritvo, 'Extinction'.
2. Carroll, *Alice's Adventures In Wonderland*.
3. Ritvo, *The Dawn of Green*.
4. Potter, *The Tale of Squirrel Nutkin*.
5. Gauthier and Aubry, *The Breeding Birds of Québec*.
6. Merritt and Matinko, *Guide to the Mammals of Pennsylvania*.
7. Pennant, *Arctic Zoology*.
8. Cronon, 'The Trouble with Wilderness'.
9. Ritvo, 'Animal Planet'.
10. Ritvo, *The Animal Estate*.
11. Ritvo, 'Animal Planet'.
12. 'About Us'.
13. Fitter, *The Penitent Butchers*.
14. Ritvo, *The Platypus*.
15. Committee of the Royal Anthropological Institute of Great Britain and Ireland, *Notes and Queries on Anthropology*.
16. Shapiro, *How to Clone a Mammoth*.
17. 'Quagga Skeleton'.
18. Ibid.
19. Miller, 'Quagga'.
20. Ritvo, 'Extinction'.

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