COMMUNITY OF DESCENT
The search for human meaning in evolutionary common ancestry

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ABSTRACT

Darwin's conception of evolutionary common ancestry inspired important writers in the nineteenth and twentieth centuries to speculate on its metaphysical, epistemological and psychological implications. These authors pursued a number of important inquiries. Could we have genuine agency if we were an accident of natural laws indifferent to human ends? Were there moral lessons in a Darwinian nature? What were our obligations to the other species with which we shared what Darwin had called the “hidden bond” of our “community of descent”? This dissertation explores some of these questions and answers proposed by authors including the nineteenth-century agnostic Thomas Huxley, the socialist radical Friedrich Engels, the moral philosopher Peter Singer, the evolutionary biologist E.O. Wilson, and the contemporary critic of humanism, John Gray. This study draws upon a wide range of historical sources and secondary literature to piece together a multidisciplinary perspective on how scientific and cultural meanings have been formed from the contested readings of Darwin's implications for “man's place in nature”. I use techniques of historiographical and literary analysis to draw out these readings in detail. The conclusion of this dissertation is that Darwin himself appreciated how far the new orientation toward inquiry opened up by his scientific account of human common ancestry challenged widespread historical and cultural suppositions about the kind of being or agent that humans are. The implications of Darwin's theory of “descent with modification” are found to be considerably more radical than some philosophers have appreciated.
CANDIDATE STATEMENT

1. This thesis contains ONLY the author’s original work towards the degree of Ph.D. – Arts, except where indicated in the preface.

2. Due acknowledgement has been made in the text to all other sources used in this work.

3. This work contains fewer than the maximum allowable word limit, exclusive of bibliographical references, and the required captioning of copyrighted material included at Figures 1 and 2.

Kirsty Machon

Editorial advice

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The following third party copyright material is included in this thesis


Abbreviations for sources

DCP — Darwin Correspondence Project. University of Cambridge. darwinproject.co.uk.

Darwin’s Notebooks

All citations from Darwin’s notebooks refer to Charles Darwin’s Notebooks 1836–1844 (2008). Edited by Paul H. Barrett, Peter J. Gautrey, Sandra Herbert, David Kohn and Sydney Smith. Cambridge: Cambridge University Press. The citation format is given as: [Notebook and original page number], followed by the page reference for the 2008 edition.

Works of Thomas Henry Huxley

When citing the works of Thomas Henry Huxley, for historical clarity, I give the original year of publication in the first citation of that work [square brackets], followed by the reprint date of the material in the published source consulted. The dates given in subsequent citations refer to the publication dates and page references in the editions/reprints of the sources consulted, as listed in the References.
COMMUNITY OF DESCENT

INTRODUCTION AND OVERVIEW

Man sometimes marvels at the living, and sometimes, scandalised at being himself a living being, forges for his own use the idea of a separate kingdom.

GEORGES CANGUILHEM

Knowledge of Life

Why is thought, being a secretion of the brain, more wonderful than gravity a property of matter? It is our arrogance, it is our admiration of ourselves.

DARWIN

C Notebook

And though we were evidently simply parts of nature—nature through and through—what nature seemed to be like could be quite at odds with what or who we thought we were like.

ADAM PHILLIPS

Darwin’s Worms

The scandal of mortality

Sigmund Freud, in The Future of an Illusion (1927), asked his readers to contemplate the value of a mortal existence. By this, Freud meant not just a life stripped of religious or metaphysical comforts like the idea one’s spirit might live on eternally after death, but life lived in a fragile and animal body, under the aegis of a human mind at once bright with possibility and dark with obscure instincts—an embodied mind with a history and a deep past, but no future beyond a certain and lonely individual death. Freud touched here on the deepest wellspring of the conflict that defined his modernist drama of the human psyche. Its principal thesis was that the human animal, because conscious of its own mortality, was in fact ambivalent towards life.
The hallmark of the Freudian neuroses was that they were born of the psychological scandal of being animal. It might be one thing to marvel at a law-bound natural world, as a zoologist or a geologist might. It was quite another to be subject to that same world’s vast and strange indifference. Freud wondered about the future of comforting illusions like metaphysical purpose or spiritual immortality in the light of his new psychology. “What is their real worth?” he asked (Freud [1927] 1961, 20). We need not here concern ourselves with the status of Freudian psychology as a science. I am content to view it as art and myth, revealing things about the human condition by uncanny means. The edifice of Freudian psychology was erected as a monument to natural man. That edifice itself is not my topic in this dissertation. But I have opened with Freud’s *Future of an Illusion* because Freud’s real philosophical target in that work also coincides with my principal interest in this study. Freud here tackles the religious instinct as an illusory expression of the architecture of our species, and from the perspective that religion is a natural and historical product of the human mind. Freud stated the implications of that perspective directly, writing that on this scientific reading humans could no longer justify assigning ourselves a place at “the centre of creation”. We must admit the truth of our “insignificance in the machinery of the universe” (49).

This dissertation is concerned with what the nineteenth-century essayist and scientific naturalist, Thomas Henry Huxley, called “man’s place in nature” (Huxley [1863a] 2001), viewed in the light of Charles Darwin's theory of branching descent. It deals with and investigates concepts and theoretical questions in both the history and the philosophy of evolutionary science. In one way, it can be described as history of evolutionary naturalism, but not an exhaustive or chronological one. Instead, it centres on how key thinkers in the nineteenth century and in the second half of the twentieth century interpreted the implications of Darwinian thought, writing on themes including morality and ethics, epistemology, agency, suffering and death, and our cosmic (in)significance. It is, in other words, an examination of the cultural discourses surrounding evolutionary common ancestry. As such, I combine historical and
philosophical analysis with forms of analysis taken from the field of literary studies. There has been an increasing interest among historians and philosophers of science in the process by which cultural meaning is constructed from scientific knowledge, and on the intersection between the production of meaning in science and the literary techniques and methods that shape and sustain those meanings in our broader culture. Natural scientists do not usually conceive of themselves as explicitly doing the work of novelists or other writers—as indeed, they are not—but historians and philosophers of science are increasingly alert to the fact that science is not some pure activity floating in abstract serenity untouched history or culture. Among the varied examples of the fruits of this more nuanced cultural and literary approach are Alan G. Gross’s studies of the role of rhetoric in scientific theories (e.g. Gross 2006), and Lily E. Kay’s historical analysis of the way in which the metaphor of DNA as a coded ‘bearer of information’, emerging against the sociopolitical backdrop of the nuclear age, powerfully inflected the science of genetics, and shaped geneticists’ representations of and claims about human nature (Kay 2000). Closer to my own area of historical interest is George Levine’s exploration of literary influences on the construction of the narratives of nineteenth-century scientific naturalism (Levine 2014). Literary themes are an indispensable tool in my study too, and I will attend throughout to aspects of the construction and production of cultural meaning from the theory of evolutionary “descent with modification” (to use Darwin’s preferred terminology), using this perspective to shed light on my broader philosophical and historical analysis.

I have said that the principal domain of this study is the discourses surrounding the question of “man’s place in nature” in the light of Darwin’s work. “Man” is a term that each of the nineteenth-century writers investigated in this study used, and so, when I discuss their ideas, shall I. Should it jar, this will, I hope, serve to heighten the reader’s awareness that whatever other assumptions these writers shed as a result of their study of Darwin and his theory of evolutionary common ancestry, they remained certain that their vocation as human beings was never in conflict with their destiny as males, to borrow a penetrating insight from Simone
de Beauvoir (Beauvoir, 1953). Darwin himself had naturalised bourgeois Victorian sex relations as a logical consequence and confirmation of his theory of descent (E. Richards 1983). My nineteenth-century evolutionists in no way strayed from this vantage point. My twentieth-century authors were—at least—obliged to acknowledge that it was, indeed, a vantage point.

Because of the interdisciplinary and nontraditional approach of this research, I will do three things in this introductory section that are principally about my method, and which explain, in particular, my reasons for choosing to investigate this using the tools of literary analysis, among other analytical strategies. First, I will establish my general questions of interest, outlining some of the methodological considerations and concerns I encountered during the research process. Secondly, I will introduce the individual writers who are examined in the chapters in this dissertation, which is structured as a series of thematically related case studies. The first part of my thesis deals with writers from the nineteenth century. In the second part, I move to some recent and contemporary writers. These case studies, readings of readings if you like, are based on and linked by particular dialectical themes that I have identified as repeatedly occurring in the historical discourse around evolutionary common ancestry. I describe these themes later in this introduction. Lastly, I will comment specifically on the productive value of one aspect taken in my approach to the study: treating Darwin as a canonical literary figure.

“Nature through and through”

The English psychoanalyst and writer Adam Phillips captures, in a few evocative words, the source of a peculiar anxiety that seems apparent in the way many philosophers and writers respond to the subject of our evolutionary common ancestry. In a short but penetrating study of Darwin, Freud and the psychological burden of mortality, Darwin’s Worms (1999), Phillips writes that Darwin’s theory of descent left readers with a descriptive account of a nature that had strict laws, but no intentions. Though we humans were
simply parts of nature—nature through and through—[yet] what nature
seemed to be like could be quite at odds with what or who we thought we
were like. (Phillips 1999, 16)

He is correct, I think, to frame Darwin’s theory of evolutionary ancestry as a
challenge to our habits of thought and disposition. Empirical evidence tells us
that humans, like other animals, are the natural outcome of the evolutionary
process of organic bodies changing over time. This is the same process that has
yielded bats, rainforests, and sea-grasses. Yet nature can seem a strange thing,
unfolding according to a logic that can seem disconnected from and even
radically other to our human intuitions, experiences and sensibilities. Moreover,
on investigating ourselves as natural agents, we find that the scientific picture of
what we are like emerges as in crucial ways different from what our
epistemological intuitions and sensory experience persists in telling us that we
are like.

Phillips frames these observations in commonsense psychological terms, but
there is evidence to support the claim. To give just one kind of example,
experiments in neuropsychology suggesting that volitional processes can be
initiated unconsciously have opened up controversies about what we call—by
convention of speech albeit without consensus on its meaning—free will. These
investigations suggest that the mind may estimate the relationship between
cause and effect in only a “rough and ready” way, and this could deceive us.
Despite our persistent sense of ourselves as agents who, in a straightforward way,
consciously author or will the actions we perform, perhaps our minds don’t truly
reveal to us how our actions are actually caused (Wegner 2003, Davies [2009]
2014; see also Huxley 1874 for a nineteenth-century discussion of this problem).
To what extent is this suggestion of a gap between what we feel we are like and
what we might actually be like the received product of our available cultural
concepts or empirical theories, and of the ways we have learned to think about
ourselves? If we learn more about the kind of agent that we are, can this really
change our subjective experience, with a gain for “epistemic evaluation”, such that our mutual understanding and even introspection could be reconstituted in light of completed neuroscience, as the eliminative materialists had optimistically hoped (Churchland 1981, 86)? Or, are we bound by the nature of the evolutionary process to remain, at least in some ways, biologically and psychologically opaque to ourselves? Can a naturalistic, explicitly evolutionary, orientation toward investigating the human species bring us closer to comprehending what kind of an agent we really are?

Since this is hardly the kind of question for a doctoral thesis, I opted for a more plausible but, I hope, productive undertaking: examining what readers of Darwin in his own time and since who have adopted an explicitly naturalistic and evolutionary approach to inquiring into the human species have concluded about the kind of agent or being that we are. Darwin’s theory of ancestry has inspired numerous writers to speculate on its metaphysical, epistemological and psychological implications. They have raised more than simply abstruse questions for philosophers of biology or historians of science. They have generated broad and influential cultural meanings from Darwin’s texts, with widespread circulation.

To speak of the generation of cultural meaning suggests that we are already in the terrain of literary theory. I have therefore chosen to investigate a number of writers who are not practising scientists, and to examine the philosophical writings of some practising scientists using the tools of cultural, historiographical and textual analysis. The authors in this dissertation are therefore treated as both writers and readers. The text they are reading and (re)-writing is Darwin’s theory of common ancestry—the claim that all organisms including humans are part of what Darwin called a “community of descent”, sharing this “hidden bond” with other organisms (Darwin 1859, 420). By “text” I mean not just the specific works like the On the Origin of Species (1859), The Descent of Man (1871) and The Expression of the Emotions in Man and Animals (1872) in which Darwin proposed, and elaborated on the elements of and evidence for, his theory of branching
descent. I also mean the cultural context in which they encountered and responded to Darwin’s ideas: the received bodies of thought and knowledge about things like human nature, human ancestry and human agency, at the time each was writing. I have examined the kinds of claims these writers have made about what our common ancestry means for human psychology, epistemology, ethics, metaphysics and even history. And I have found some identifiable and recurrent themes, each of which I believe emerges from that vague anxiety I identified at the beginning of this introduction: the sense of an epistemic gap—a disjuncture requiring explanation—between what we are like according to the evidence and description of empirical science, and what we feel that we are like. Edward O. Wilson, one of the writers whose reading of Darwin is examined in this dissertation, has claimed that this gap between, in lay terms, mind and body, is one of the last major lacunae in “the intellectual terrain”, but he thinks it may soon be closed by the consilience of the natural and the human social sciences through what he calls borderland disciplines, like cognitive neuroscience, and evolutionary psychology (Wilson 2000b, vii). He speculates that new scientific knowledge might equip us to actively decide on the future actions we take as a species. I think there are very good reasons to be sceptical about Wilson’s project, and the way he frames his central claims. But this doesn’t make the task of investigating and inquiring into our limits and possibilities as natural agents pointless. Indeed, in an age when our actions have so much impact on the world that generated and supports us as a species, it is surely crucial to try to extend, as far as we are able, our knowledge about the kind of relationship we have to that world.

There are certain challenges in writing a dissertation that is dependent on interpretation and on the art of reading—both on my own readings, and those of others. One potential concern is that is one might end up simply re-describing what other people wrote about Darwin, or grasping at themes that are arbitrary or chimerical: what seems real and obvious to me might not be so to others. Another is that by privileging textual analysis, there is the risk of producing a disembodied study that fails to capture the fact that while philosophy or poetry
both proceed well enough in the abstract, biology is a blood-and-guts thing. Equally, philosophy, poetry and biology all emerge from the mercurial and messy domains of human psychology and culture. In approaching my task, I have tried always to bear in mind that we are, as Paul Sheldon Davies reminds us, earthy as well as earthly creatures or, less whimsically, “subjects of the world” (Davies 2014).

There are, however, some advantages to this kind of approach. It keeps one always alert to the fact that knowledge construction is a cultural and contested process. The state of knowledge, like the accepted or standard reading of a particular historical text at any given time, is always provisional and temporary. Historical figures are not stable points of reference. The task at hand is not to identify some essential or essentially correct Darwin against which to judge the fidelity of subsequent interpretations. Nor does the career of “Darwinism” proceed seamlessly and inevitably from Darwin by one logical theoretical development after another to the present state of our aggregated claims.

Some authors write as if they seem to think it does. The evolutionary psychologist John Cartwright (2001) concludes a study of the historical impact of evolutionary studies on anthropology and psychology with a statement of unquestioned faith in science as well as territorialist hostility to cultural analysis. Cartwright is certain that “in the coming decades of the 21st century, more pieces of the human jigsaw will be put in place with advances in the human genome project and neurobiology, and with Darwinism cutting ever deeper into the human psyche” (Cartwright 2000, 342). Cartwright thinks that future historians reflecting on the debates about human nature across the twentieth century will conclude that “scientists and intellectuals” allowed the power to define human nature to be “snatched away” from them by the “the social sciences and cultural relativists” (343). Cartwright reluctantly concedes that certain “lines of inquiry” may be “socially conditioned”, but leaps straight from that to an assurance that scientific knowledge is no “social construction” (331). This move leaves no room for the possibility that the “cultural relativists” might be on to something useful.
in pointing out that knowledge proceeds not simply by the honing of a cutting edge, but also by faltering steps, false assumptions, misreadings, and imaginative lines of flight. This is by no means the same as saying that no genuine knowledge emerges (although that has been the claim of some), but it is an observation that should surely subdue the extravagance of certain ways of framing knowledge claims.

Out of all this comes a picture of knowledge as constructed by, and constructing, both facts and myths—but myths, as we shall come to see, can reveal things to us in a manner independent of and quite different from science. Richard Dawkins, in *The Ancestor’s Tale* (2004) chose to tell his tale of evolutionary ancestry by working backwards from the present, because he wanted to avoid carelessly confirming the idea of evolution as proceeding “one damn species after another” to the humans. (Dawkins 2005, 1). Dawkins wanted to emphasise the rich strangeness of evolutionary descent: there are rhymes and patterns in evolutionary change, but it is mistaken to imagine evolution as linear progression, or heading anywhere in particular. With this in mind I, too, have pursued rhymes and patterns rather than try to tell a strictly linear history of ideas.

**Darwin’s ‘open fields’**

When I started to look at the way in which Darwin wrote about human descent, I found not a confident statement of what humans are “like”, but the elements of a proposition. Darwin’s proposition—emerging as he pieced together a vast body of scientific evidence and observation about the natural world and about other species that was by no means all his own—was that *we cannot be like the kind of being supposed by present science and metaphysics*. Darwin could “no longer believe that man is the work of a separate act of creation” (Darwin 1871, 676). The development of moral qualities lay in “the social instincts” (680), rather than being a divinely inspired endowment. Man had “no or few special instincts” (681). The use of “weapons of all kinds, musical organs, both vocal and instrumental”
had each been gained through a natural process of mate selection, no different to the manner in which an Argus pheasant had gained its ornamental beauty. Most strikingly, as Darwin put the matter, “we thus learn that man is descended from a hairy, tailed quadruped, probably arboreal in its habits.” The dimly perceived progenitor of all vertebrates must have been “more like the larvae of existing marine Ascidians than any other known form” (679). Such conclusions, he noted, with an understatement laden with irony, would be “highly distasteful” to many of his readers (689). I have set out the various elements of this proposition in a table, based on Darwin’s arguments in *The Descent of Man* (1871).

<table>
<thead>
<tr>
<th>Area of investigation</th>
<th>Evidence for common ancestry</th>
<th>A challenge to …</th>
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<tbody>
<tr>
<td>Bodily structure/development</td>
<td>Homologous structures</td>
<td>Theory of special creation</td>
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<td>Variability</td>
<td>Morphological idealism</td>
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<td>Rudimentary/disused organs</td>
<td>‘Secondary laws’ of creation.</td>
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<td>Developmental/embryological resemblances</td>
<td>Teleological explanations</td>
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<td>Development sensitive to changed conditions</td>
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<td>Mental powers</td>
<td>Shared instincts with other animals</td>
<td>Theories of special creation</td>
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<td>Tools and weapons used by animals</td>
<td>Polygeny</td>
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<tr>
<td></td>
<td>Animals have powers of reason, imagination, memory</td>
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<td>Emotional expressions of animals</td>
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<td>Communication among animals</td>
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<td>Belief in spiritual agency among “savages”</td>
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<tr>
<td>Moral sentiments</td>
<td>Durability and primacy of social instincts in animals and in humans</td>
<td>Distinction between ‘formal’ and ‘material’ morality</td>
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<td>Mutual aid and the power of sympathy</td>
<td>Utilitarian principle of ‘greatest happiness’ as motive for moral conduct</td>
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<td></td>
<td>Struggle between opposing instincts in animals</td>
<td>Special creation</td>
</tr>
<tr>
<td></td>
<td>“Savage” cultures had cohesive social and behavioural codes</td>
<td></td>
</tr>
<tr>
<td>Sexual selection</td>
<td>Courting birds, jealous beetles, battling males</td>
<td>Appeals to the divine to explain the human sense of beauty, art</td>
</tr>
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<td></td>
<td>Aesthetic faculty discernible in animals</td>
<td>Polygeny</td>
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<tr>
<td></td>
<td>Dimorphism of secondary sex characteristics</td>
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<td></td>
<td>Cultural and aesthetic expression in human societies</td>
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Table 1: Summary of the elements of ‘Darwin’s proposition’ on human origins in *The Descent of Man* (1871).
That Darwin himself understood the significance of his project in this way—as a novel theoretical perspective from which to undertake future research—is captured in this quote from the *Origin*.

When we no longer look at an organic being as a savage looks at a ship, as at something wholly beyond his comprehension; when we regard every production of nature as one which has had a history; when we contemplate every complex structure and instinct as the summing up of many contrivances, each useful to the possessor, nearly in the same way as when we look at any great mechanical invention as the summing up of the labour, the experience, the reason and even the blunders of numerous workmen; when we thus view each organic being, how far more interesting ... will the study of natural history become! A grand and almost untrodden field of inquiry will be opened ... (Darwin 1859, 485–6)

Darwin did not dwell on human ancestry in the *Origin* even though he had begun to work on a ‘Note on Man’ originally intended for inclusion in a large volume on the theory of natural selection that he had begun to prepare in the mid-1850s (Stauffer 1975 (ed.), Desmond and Moore 2010). This note never made it into this so-called species book (from which the *Origin* was ultimately abstracted). In an 1857 letter to Alfred Russel Wallace, the naturalist whose own theory of transmutation, with its close similarities to Darwin’s, would spur him to publish, Darwin wrote that it was his intention to “avoid” the topic of human ancestry in his species book, as it was “surrounded with prejudices” (*DCP*, Letter 2192). This signaled by implication that man was in his frame of evolutionary descent. Nor, in 1859, was man absent from the *Origin*, with Darwin writing that:

In the distant future I see open fields for far more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation. Light will be thrown on the origin of man and his history. (Darwin 1859, 488)
The remark is brief, but not, I think, “coy”, as is sometimes claimed (e.g. Cartwright 2000, 3). In fact, it quite precisely captures the radical project that Darwin himself would undertake in the Descent—and not in the “distant future”.

Note the echo in these two passages: “open fields”; “untrodden field”—Darwin’s field motif suggests expansiveness, vernal fertility, virgin territory ripe for exploration, but also, for cultivation, domestication, and colonisation. As Darwin had foreseen, his fields of inquiry were indeed fertile. And this brings me to my writers, because the writers I chose to look at in this study each identified as explicitly being engaged in a project of cultivating these soils that were so rich with the earthy promise of a new, naturalistic way to think about the human condition.

**Darwin’s readers**

The writers I examine wrote across three centuries, but have this in common: each took Darwin’s naturalistic theory of evolutionary common ancestry to have implications not just for narrow questions in natural history or zoology, but for culture and the human condition more broadly. Each was building on, imagining from, this new orientation for inquiry, and incorporated Darwin’s ideas into larger philosophical, metaphysical and epistemological projects. One criterion for the inclusion of particular writers in this dissertation is that there was some legitimate intellectual novelty in treating that writer as a reader and literary figure engaged with the production of cultural meaning from ancestral texts—in this case, speculating on what it might mean to be “simply a part of nature”.

**T.H. Huxley (1825–1895)**

Thomas Henry Huxley will be something of a travelling companion throughout this dissertation, because his ideas intersect with those of the other writers in interesting and productive ways. Huxley is, of course, famous as Darwin’s so-called “bulldog”—a trenchant and formidable Victorian proponent of evolutionary theory. I treat him not as the pugnacious tail wagging the Darwinian
dog, but as a literary figure, intellectual, and philosopher of knowledge inspired by Darwin’s theory of common ancestry in the pursuit of his own scientific naturalism (which Huxley took to be moral and ethical project in its own right). Huxley could certainly be described as a professional scientist—one of a new breed in the nineteenth century who would make their living from applied natural knowledge, and has been studied from that perspective (Turner 1974, White 2003). In fact, Huxley disparaged the term “scientist” as one that vulgarised the loftier goals of his naturalistic project. “Scientist” was “about as pleasing a word as ‘electrocution’” Huxley fulminated in 1894 (quoted in Secord 2014, p. 105).

Huxley refused to identify himself a metaphysical materialist. He is often carelessly represented as such. The historian Oren Harman, for example, has supposed that Huxley rejected all “resistance to the logic of materialism” (Harman 2011, 14). However, Huxley had a nuanced and sophisticated attitude to materialism, and his refusal to identify as a materialist is crucial to understanding why Darwin’s theory of evolutionary common ancestry resonated so strongly with Huxley. Huxley had initially been a sceptic about the possibility of transmutation (L. Huxley 1900), and he continued throughout his life to entertain well-known doubts about the evidence supporting Darwin’s theory of natural selection (e.g. Huxley 1859 and 1878). Nonetheless, Huxley was one of the nineteenth century’s most important proselytisers for the theory of evolutionary common ancestry. He is frequently represented as a rather two-dimensional figure—an astute, ambitious operator on the Victorian scene, blazing away at the clerics. Joe Cain, in introductory notes to an edition of Darwin’s The Expression of the Emotion in Man and Animals talks about him almost precisely in these terms. Cain writes that Huxley is “famously remembered as Darwin’s bulldog—a less well-known figure who simply defended Darwin in public”, but says he could “just as easily be depicted as an astute opportunist, exploiting one of the gaping holes left open by Darwin’s obvious silences in the Origin to make a name for himself” (Cain 2009, xiv).
I examine Huxley’s approach to human psychology and his famous position on ethics as related products of his agnosticism. His work is very sensitive to one particular strand of thought in Darwin’s account of evolutionary descent: the idea that humans are “productions” of a mechanically law-bound cosmos. Huxley developed the vision of a vast cosmos quite indifferent to the organisms its laws produced. Darwin’s theory of ancestry was combined with Humean scepticism, and Huxley concluded that our origins set limits on both our senses and on our psychological makeup. Humans could never really know what nature was ‘like’—even with the best empirical science. Nor could they penetrate the internal mysteries of consciousness (Huxley [1886] 1892). Crucial to his naturalistic perspective, there could be no end to the facts of suffering, pain and death. Intrinsic to the evolutionary process, these were a condition of being alive at all. The moral goal of scientific knowledge in an ontologically indifferent cosmos was to reduce the burden of that suffering in the human domain of action.

**Friedrich Engels (1820–1895)**

Darwin had characterised organisms as “products of nature”. This was suggestive and revealing in a century that linked nature with economics in the high age of manufactories and Malthusianism. Few scholars have really investigated the way in which the German radical and intellectual collaborator of Karl Marx, Friedrich Engels, incorporated Darwin’s ideas into his philosophy of dialectical materialism—or why he was motivated to do so. Darwin does not seem an obvious ally for Engels. As a socialist, Engels had a political distaste for Darwin’s emphasis on the role of individual competition and for what Darwin had called the “struggle for existence” in the process of natural selection. And as a thinker influenced by the Hegelian account of historical change and process, Engels scorned Darwin’s empirical method of building his argument for species origins. Finally, the thoroughly humanistic aim of Engels’s political philosophy meant he was supremely uninterested, unlike Darwin, in the details of natural history, or in the expressive behaviour or psychology of animals.
But Darwin's explanation of human ancestry had an appeal for Engels. Engels literally welded the idea of “descent with modification” to his account of human social change. Engels wanted to present social change as operating by natural laws. Social change was represented as driven, just like Darwinian evolution, by the interaction between organism and environment—the feedback between the human organism, the technologies humans developed, and the environment that those technologies and interventions constantly modified. Both humans and animals were the evolutionary products of natural laws. But to be human was defined by Engels as emergence from the animal condition, a process driven inevitably by the technologically-mediated acquisition of knowledge and culture, forcing an ever-greater distance between the creative world of humans and the responsive world of animals. Engels may not have liked Darwin's emphasis on struggle, but he did not ignore or deny it. Instead, he defined the struggle for existence as the animal condition; as that which had to be overcome. The capitalist state was, for all its modernity, still in this animal state of struggle: it neither predicted nor controlled the remoter social effects of its technologies of production. Engels staked all on the idea that social evolution operated as a scientific process identical with natural laws: by mastering those laws, humans could learn to control technologies of production in a rational way that predicted and controlled for their social ill effects. In this, they would emerge as truly human, the animal falling away.

**Peter Singer**

That humans emerged from an animal condition was crucial to the implications both Huxley and Engels drew from the theory of evolutionary common ancestry. Darwin had talked of a “community of descent” with all other organisms, but neither Engels nor Huxley was concerned with what this “community” might mean for our ethical relationship to those nonhuman animals. In the later twentieth century, however, this became a central question for some moral philosophers. Peter Singer is the most influential figure in a group of writers who drew from Darwin's emphasis on evolutionary continuity a set of specific conclusions about the moral status of animals. In the *Descent* and the *Expression,*
Darwin had emphasised that the evolutionary development of mental powers was a gradual process: there was no great saltation in the process leading from animals to the human mind.¹

The theme of gradual change and continuity in Darwin's account of the evolution of emotions, mental states and moral sentiments was emphasised by Singer and others to argue for the extension of moral consideration to nonhuman species. On an analogy with racism and sexism, it was argued it would be inconsistent to deny moral consideration to a being simply on the basis of species membership. In this dissertation, I pursue what I think are the limits of this claim, and argue that Darwin's formulation of evolutionary common ancestry has implications that, when pursued, are considerably more radical than Singer appreciates, and which undermine the premises of his utilitarian assumptions. In particular, I argue that Singer's moral philosophy deals very badly with the objective fact of suffering. Since *Animal Liberation* (1975), Singer has reassessed the boundaries of his ethical theory more broadly, in the light of developments in evolutionary biology, anthropology and psychology (Singer 1981, 1999, and 2005). I suggest there are reasons to be dubious about the approach Singer takes to reconciling his theory to the epistemological challenges of a naturalistic, evolutionary approach to study of ethics.

*Edward O. Wilson*

It was the American myrmecologist E. O. Wilson who introduced the term “sociobiology” into popular scientific discourse. Wilson's central claim, in his book of the same name, was that the traditional tools of ethicists and philosophers were not the right ones for investigating the human species as the product of evolutionary descent with modification. To properly carry out this

¹ The present view from the archaeological evidence is that human behaviour indeed underwent a dramatic ‘saltation’ about 50 thousand years ago (Klein 2009), and it has been suggested that genes involved in brain development may have evolved especially rapidly in the human line after the split from the chimpanzee line (Pollard et. al., 2006).
inquiry would require investigation with the mathematical and analytical tools used by evolutionary biologists to understand the behaviours of other species, approaching the matter as though “zoologists from another planet” (Wilson [1975] 2000a, 547). Much has been written about this project by commentators sympathetic to and hostile to Wilson’s sociobiological ideas (e.g. Ruse 1979, Lewontin, Rose and Kamin 1984, Kitcher 1985, Hull 1988, and Segerstrale 2000; see also several reviews and essays collected in Maynard Smith, 1993). But Wilson has written many books since aimed at a wider popular readership.

In this dissertation, I examine Wilson’s work from a novel perspective—in both senses of that word. I treat him as a scientist engaged in a lifelong literary project that tells a story about “human nature” (Wilson 1978). Wilson’s popular scientific writing uses a number of highly literary techniques, and there is something quintessentially novelistic about his central idea: he invests his universalising account of evolution (Hesketh 2014, Megill 2015) with both a moral point and a happy ending (Wilson 2012). The moral point is that the human species is on a trajectory of “autocatalytic” (Wilson 2000a, 575) social evolution that if not properly understood could threaten the biosphere that supports us and other species. The happy ending is that if we learn enough about ourselves as natural agents, we may be able to change course, stop this from happening. Wilson writes that we are part-primate, but part emergent product of a highly elaborated culture (Wilson 1988 [2006]). That elaborate culture is now locked on its own evolutionary trajectory, but we still retain some evolutionary dispositions of the primate mind. To act differently, we need to “grasp human nature objectively” and “comprehend its ramifications by cause-and-effect explanations” through scientific “borderland disciplines” like cognitive neuroscience (2000b, vii).

Wilson thinks everything from the chemosensory world of ants, to the human urge to colonise other planets, is ultimately susceptible to empirical explanation. Yet this great systematiser has also identified himself as leaning towards a deistic view of the natural world (Wilson 2006). But while it might, in theory, be possible to account in one way for everything from DNA to Shakespeare, natural
phenomena can be described and studied in different ways, for example, at the reductive levels of molecular biology, at the level of organisms, or at the level of culture. Wilson’s literary idiom changes as he moves between these levels of explanation and analysis. In *Sociobiology*, he affronted many readers by conducting a conversation about humans using the analytical terms of population biology. In other works, he describes nature in terms that are highly Romantic, and even sentimental, or speculates on science fiction futures with the scintillating language of transhumanist-style fantasies in which natural selection is overcome by human artifice. The author of *Sociobiology*—once accused by his critics of joining a long parade of “biological determinists whose work has served to buttress the institutions of their society by exonerating them from the responsibility for social problems” (Allen et. al. 1975, in Caplan 1978 p. 264)—is, on my reading, the great moraliser of Darwinian literature.

**John Gray**

Wilson’s scientific Enlightenment is a universal vision—that is, it is also temporal. Wilson thinks humans might use knowledge about our evolutionary past to make rational decisions in the present about our future course of action. This is, as he admits in his book *Consilience* (1998) faith rather than science. For another of the authors in this study, John Gray, this faith in salvation via scientific self-analysis represents just so much more of the human species’ apparently endless capacity to deceive itself. Few humanities scholars have taken much notice of the central and strategic employment of Darwin’s theory of ancestry in John Gray’s attack on humanism in *Straw Dogs* (2002). But Gray opens his book with a consideration of the statement that “Darwin has shown that we are animals”, although he follows this idea to a radically different conclusion to that of Wilson or my other writers (Gray 2003, xi). For Gray, the statement “humans are not central” entails a much more radical re-assessment of our assumptions about ourselves than many have appreciated—including evolutionary psychologists and biologists. Were scientists to truly draw the correct inferences from the observations that deception is common in the natural world and that “an interest in truth is not needed for survival or reproduction”
Gray thinks they would see that humans can’t be anything other than ultimately irrational beings—“a conclusion few rationalists have been ready to accept” (28). Daniel Dennett famously likened Darwin’s theory of evolution to a universal acid, by which he meant it corrodes the foundations of an older metaphysics as well as some conceits of human psychology (Dennett 1995), but Gray applies that acid at a much more corrosive strength than any of my other writers.

**Themes in the discourse of evolutionary naturalism**

I read each of my writers as responding to a related set of questions that emerge from Darwin’s propositions about our evolutionary common ancestry.

- Can the human species have genuine agency if we are an accident of natural laws indifferent to human ends? What might this look like?
- If our moral canons are a contingent product of our evolutionary descent with modification, then what might it mean to call an act “right” or “wrong”?
- What limits does evolution place on our epistemological access to the world?
- What are our obligations, if any, to other members of the human species? To nonhuman animals?
- If we can learn more about the kind of agent we are, will we be able to decide to change the way we act in the world?

Running through the works of the authors in this study are some repeated, paired, themes that structure an internal conversation or drama in their writings. This idea of dialectical themes is one I borrow from a biography of Alfred Russel Wallace by Michael Shermer (2002). The important thought is that these paired themes coexist in tension. Sometimes, that tension is expressed within the text itself, in the form of contradictory or conflicting tendencies, statements, or conclusions. At other times, the tension emerges between my authors, and their
different or rival interpretations of Darwin, sometimes played out in their own readings of each other. The ideas that these writers repeatedly wrestle with are: suffering—compassion; moral agency—biological determinism; (cosmic) significance—(evolutionary) insignificance; organic bodies—scientific bodies; cosmic/wild nature—the anthropogenic world; and progress—degeneration.

I have also identified two kinds of perspectives to inquiry taken by my authors. On the one hand, there is a perspective on humans that I shall call the zoological, contrasting with an anthropological perspective (in which the scientific questions about “man and nature” play out as part of an embodied drama of human psychology and cultural life). It is, of course, impossible to strictly maintain either perspective: my authors move between them at various times—as did Darwin himself.

Several other historical and contemporary authors are given some attention in this study, as their ideas relate to themes of my principal authors. Among them are the Russian-born anarchist-in-exile, political theorist and naturalist Piotr (Peter) Kropotkin (1842–1921), the British novelist and intellectual H.G. Wells (1866–1946), and the moral philosopher James Rachels. There are also several authors who, while they were arguably legitimate candidates for inclusion in this study, were set aside. Herbert Spencer, while an important historical figure in the broader cultural reception of Darwin’s ideas, was engaged in an intellectual project indebted to scientific ideas and political commitments that pre-dated Origin. Alfred Russel Wallace’s influence as a reader of Darwin is, I would suggest, historically limited (a recent revival in scholarly interest notwithstanding). His turn to non-naturalistic explanations for the human mind was a reason to exclude him from specific discussion in my dissertation. I also considered including Julian Huxley, however, his close connection to the history of the evolutionary modern synthesis would have required his ideas to be assessed in a substantially wider historiographical frame of reference not feasible in the scope of this work.
What’s original in the *Origin*? Darwin as canonical literature

Although much of this dissertation concerns itself with cultural, philosophical and historiographical aspects of Darwin’s work and its interpretation, I want to draw attention in this introduction to an important strand of my analysis throughout, and focus in on Darwin’s works as literature. Darwin’s works have specific features that make them unusually open to interpretation. This openness, I suggest, is one outcome of a deliberate strategy on the part of Darwin, who acknowledged, but refused to definitively offer his own views about, some of the important questions that his theory of human ancestry raised: hard questions about the origin of life, the nature of consciousness, what we can know about the mental states or experiences of other species, and free will.

Gillian Beer (1983) has examined how Darwin was influenced by literature, and how his evolutionary narrative influenced literary figures including George Eliot. George Levine (1988) has also looked at Darwin and the nineteenth-century novel. My project is different, in that I apply this literary approach to the analysis of forms of scientific and philosophical texts not typically approached in this way. By drawing attention to Darwin’s work as literature I am not suggesting we treat his scientific ideas as though literally fictitious. What I mean is that I emphasise Darwin as a canonical literary figure. Darwin’s scientific texts have been among the most productive of wider cultural meaning and exchange in the Western literary canon. Later contributors to the “story” of human nature—including such literary giants as Freud, who was highly original and productive in his own right—can be read as struggling with what the literary critic Harold Bloom (himself invoking the terms of Freudian psychology) has termed the “burden of influence” (Bloom 1995, 8). Philosophers, scientists or psychologists writing after Darwin could choose not to like Darwin’s ideas about human common descent, to reject them, to embrace them, to feel ambivalent about them, to regard them as “eclipsed” by better conceptions (J. Huxley, 1942) and so on—but it was
difficult to ignore their existence altogether, and doing so would still be a kind of active position in relation to them.

Bloom thinks texts that attain canonical status actually have a striking quality in common—they are genuinely cognitively original, rather than merely brilliantly synthetic. He has described this quality as a “strangeness that we [as readers] either never altogether assimilate, or that becomes such a given that we are blinded to its idiosyncrasies” (4). I suggest in this dissertation that Bloom’s characterisation of canonical texts as having a mark of cognitive originality is particularly apt to Darwin.

Pondering the psychological roots of canonical influence, Bloom goes on to write:

[Literary] tradition is not only handing-down or process of benign transmission; it is also a conflict between past genius and present aspiration, in which the prize is literary survival or canonical inclusion ... Poems, stories, novels, plays come into being as a response to prior poems, stories, novels and plays, and that response depends upon acts of reading and interpretation by later writers, acts that are identical with the new works. (8)

In spite of, or perhaps because of, the textbook familiarity of Darwinian evolution and because neither philosophy nor evolutionary science has been short of pundits willing to offer quite definitive statements about what Darwin meant, it is in fact very easy to fail to appreciate this aspect of his originality. This observation does not require overblown claims about scientific revolutions. Other writers before Darwin had speculated that species were not fixed. The facts and observations Darwin drew on in his scientific works came from a wide variety of scientific sources and authors: his networks were highly developed and his reading wide (Greene 1977). And writers since antiquity had written of animals as possessing qualities described at various times as intelligence, passions, sagacity, or the power to reason. But none had conceived of the human relationship to the natural world in the manner of Darwin’s theory of descent with modification—as human and nonhuman animals being the product of aggregated effects of
natural, law-bound processes mechanically indifferent to the sensible, suffering beings they had constructed.

My authors told their own kinds of stories about human ancestry—but in each case, this was premised on the assumption that there was something provocatively and insistently original in Darwin’s formulation of descent with modification and common ancestry. As I believe Darwin makes explicit in his works, accepting this theory of human origins would mean accepting much that was fundamentally counter-intuitive to our own deeply ingrained psychological convictions about what were like. Freud responded to the ontological challenges posed by the developing sciences of human origins with pioneering but flawed works in naturalistic psychology like Totem and Taboo (1913), revealing and recondite in equal measure.

Darwin himself clearly realised that the resistance to his claims about human common ancestry would be in large measure psychological (Davies 2014, Gross 2006). He had, for starters, as a middle-class Englishman steeped in the language of Milton and the scientific imaginary of William Paley’s organism-designing watchmaker (Paley 1802), needed to convince himself of their truth—a drama that Gross, in an elegant study of scientific rhetoric, traces via changes in the grammatical features and structures of his notes in which the expressive form tracks the psychological process of his increasing certainty. Paul Sheldon Davies thinks that there were two crucial “deficits” in the human imagination to which Darwin was alert when he wrote Origin: firstly, that our overall orientation to ideas tends to be ahistorical. This is reinforced by the second—that humans tend not to notice conflicts within our minds. We frequently accommodate and tolerate what may even be mutually exclusive kinds of ideas.

A literary approach allows us to look into the act by which Darwin constructed but also communicated what would be an audacious, unified scientific narrative about the human place in a grand, fundamentally strange, cosmos. For this, I suggest, is what Darwin himself came to think that he had done—whether he
initially intended his speculations on species origins to lead that way or not. Concluding *The Variation of Plants and Animals under Domestication*, for example, Darwin pointedly linked a discussion on variation, plasticity and selection in plants and animals to the question of creative omniscience.

If we assume that each particular variation [in a plant or animal] was from the beginning preordained, than that plasticity of organisation, which leads to many injurious deviations of structure, as well as the redundant power of reproduction which inevitably leads to a struggle for existence … natural selection, or survival if the fittest, must appear to us as superfluous laws of nature. On the other hand, an omnipotent and omniscient Creator ordains everything and sees everything. Thus we are brought face to face with a difficulty as insoluble as is that of free will and predestination. (Darwin [1868] 1998 Vol. 2, 428).

Perhaps some of the more excessive, notorious and over-reaching claims about Darwin have been the product of what I will call careless reading, or rather, careless discourse. Darwin often seems to say things that are ambiguous. Barri J. Gold, in a perceptive study of the ways in which energy and the emergent science of thermodynamics found expression in Victorian literature says, with some truth and a little self-deprecation that “where there is ambiguity the literary among us will not be far behind” (Gold 2010, 3). Ambiguity can suggest. There is an even better reason for dwelling on ambiguity in Darwin’s case—because, as I aim to show in this thesis, it can mislead the reader.

One example of the kind of literary pattern you can find in Darwin’s work is in *The Formation of Vegetable Mould through the Action of Worms* (1881). It is a comparatively little-studied book (though it did inspire Phillips 1999), with a perhaps unprepossessing title, but it is a work in which we can find a crucial clue to understanding Darwin’s method as a scientific puzzler and thinker, and the often subtle ways in which he framed his challenges to prevailing metaphysical claims. In the example I will offer here, the prevailing metaphysical claim being challenged is that humans are endowed with intrinsic cosmic purpose, and
central to the plans and laws of a being that created them. The clue to our reading is the idea of scale.

The first chapters of this book are comprised of a detailed study of the structure and behaviour of common earthworms. This includes speculations on their mental states and highly intricate descriptions of their anatomy and behaviour, detailed in a number of highly idiosyncratic, painstaking and very personal, intimate experimental observations. Later, the story of the worms is given a macroscopic and historical context, when Darwin explains how the actions of worms have played a central role in producing the soil on which agriculture (and so civilization). This same action has both preserved, and destroyed, the archaeological remains of collapsed civilisations. All of this occurs without the slightest regard for individual human existence, future purpose, or the ambitions of those lost empires.

“Worms have played a more important part in the history of the world than most persons would have supposed,” Darwin wrote (Darwin 1883, 308). Worms have preserved “tessellated pavements and other ancient remains.” It was also probable, he went on “that many monoliths and some old walls have fallen down from being undermined by worms” (312).

This movement, between the minute and the enormous, is a notable feature in Darwin’s writings and observations of the natural world. Darwin was a remarkably sensitive reader of what we might call the text of the natural world—he read, if you like, between and into nature’s lines. At both ends of this picture—from the stratified social world of ant slavery to the famous geological mystery of the parallel strata in the hillsides at Glen Roy (Darwin 1839)—Darwin found nature unfolding with mechanical regularity on a scale that was not human. He drew his own conclusions from these perspectives (although often, he stopped short of drawing them in full).
Mind-producing, mind-produced: on an anthropocentric perspective

I will have more to say about perspectives throughout this dissertation, but before I conclude, a word about one kind of perspective—the so-called “anthropocentric” or human-centred perspective—is in order. One obvious corollary of Darwinian evolution is that we live, in the first instance, in a mind-producing, not mind-produced, world. Huxley counted idealist philosophers, metaphysical materialists and those who deferred to a priori arguments or abstract notions (like the English anatomist Richard Owen’s mysterious “creative secondary laws” of nature, or Herbert Spencer’s progressively developing social-state-as-organism) as being fundamentally in error. But there is, obviously, another sense in which—as Huxley and Engels both recognised—it is perfectly correct to speak of our living in a mind-produced world. We modify the physical world each day, creating spinning jennies and sewerage systems, cars, computers and large hadron colliders. We modify ourselves, too—injecting hormones, attaching limbs, or ingesting chemicals to alter our perceptions. We are socially, physiologically and psychologically modified by technologies, directing even as directed by them. The present human species is the product of a dynamic relationship of intensifying feedback loops between our physical environment and our information-saturated social systems (Sterelny 2012, Suddendorf 2013).

Inspecting ourselves as animals, we have the difficulty of being both the subject and the object of our research: as the philosopher of science Arthur Fine has put it², we don’t “stand outside the arena ... and then ... judge from an external point of view ... We are in the world, both physically and conceptually ... We are among the objects of science” (Fine 1984, in Curd and Cover 1998, p. 1201). The relationship between human practices and the rest of the natural world, and consequently, questions of how we act in that world, are far from abstract problems. By the turn of the twenty-first century, to pluck just a few examples from a multitude of possibilities, dams have extensively fragmented natural

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² Referring to the epistemological challenges for scientific realism
habitats in more than 60 per cent of the world’s river basins, and major rivers including the Colorado River in the USA and the Yellow River in China no longer reach the sea in dry seasons (Johnson, Revenga and Echeverria 2001). The individual action of driving a car changes the local composition of the atmosphere. It has been estimated that there are more than one billion cars on the world’s roads. 3 A discarded plastic trinket ends up in the gullet of a nesting seabird on a remote atoll, the bird having mistaken the obscure human object for prey, acting according to particulars of its own nature (shaped by the necessities and contingencies of evolutionary processes) as, perhaps, the driver or litterbug acts according to hers. We know this objectively, yet, frequently do not act to prevent even foreseeable undesirable outcomes. John Gray pessimistically puts it thus: “If there is anything unique about the human animal it is that it has the ability to grow knowledge at an accelerating rate while being chronically incapable of learning from experience” (Gray 2014, 75).

While it is useful to recognise that the anthropocentric perspective is, indeed, a perspective, rather than a universal view, the idea that we might deliberately choose to renounce this perspective may practically amount to little but a posture, and obscure some of the ways we might undertake the task of examining our fundamental assumptions about human nature in the considerable light shed by Darwin’s thought, work that began in the nineteenth century and was carried by a host of subsequent writers. E. O. Wilson, no less than he who popularised the concept of biophilia has also argued (e.g. E. O. Wilson 1978) that there are very good reasons to take an anthropocentric interest in the question of what we humans are like. In what qualities of our interaction with the natural world we so drastically act upon do we differ from (or concur with) the other living things in it? Uniquely human (to the best of our knowledge) is the fact of our inquiring into these matters at all.

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1. THE WHITE APE: ON DARWINIAN COMMON ANCESTRY

1.1 The fratricidal bee

“[A]ny animal whatever, endowed with well-marked social instincts, the parental and filial affections being here included, would inevitably acquire a moral sense or conscience, as soon as its intellectual powers had become as well, or nearly as well developed, as in man.” So wrote Darwin in The Descent of Man (Darwin [1879] 2004, 120–121). The tone was matter-of-fact. It was a notable characteristic of his writing by this period. The argument of the Descent proceeds page by page, fact upon fact, with a dogged insistence.

Darwin had been long ruminating on these ideas, expressing them with considerably more effusiveness (if only in his private notebooks) more than twenty years before the publication of On the Origin of Species. He had scrawled in the notebook he had labeled M that the fact that conscience “varies in different races” was really “no more wonderful than dogs should have different instincts” (M75, 537). Or more pointedly, “Our descent, then, is the origin of our evil passions!!—The Devil under form of Baboon is our grandfather!” (M123, 550)

Darwin was also thinking in terms of what these thoughts about descent might imply for notions such like that of “higher” and “lower” organisms. Although Darwin would continue to use this relative language, it is clear that in 1838, he already understood that it was a manner of speaking or a descriptive convenience, stripped of any metaphysical connotation. “It is absurd to talk of one animal being higher than another. —,” Darwin mused, late in 1837. “We consider those, where the cerebral structure intellectual faculties most developed, as highest. —A bee doubtless would when the instincts were” (B74, 189). Even so, Darwin’s measured tone, over thirty years later in the Descent, could hardly mask the incendiary implication of this proposition.
If ... to take an extreme case, men were reared under precisely the same conditions as hive-bees, there can hardly be a doubt that our unmarried females would, like the worker-bees, think it a sacred duty to kill their brothers, and mothers would strive to kill their fertile daughters; and no one would think of interfering. (Darwin 2004, 122)

One’s sense of right and wrong, on this formulation, did not come from some external, eternal or esoteric principal or fiat. If a pointer dog were able to reflect on its conduct it would, Darwin thought, inwardly struggle with its impulses, weighing its course of actions by reference to an “inward monitor” that would tell it that “one course ought to have been followed, and the other ought not, the one would have been right and the other wrong” (123). Darwin’s point was that the content of that “ought” was a species-dependent, contingent and mutable—the natural product of an organic process that had simply chanced to run in the one direction, rather than another. Social animals might, indeed, follow “widely different lines of conduct” (122). Human morality, following this line of thought, was simply an expression of social instincts whose first stirrings could be found in the blood, exoskeletons or fundaments of even those usually considered the lowest of beasts. It may have been that man alone could “with certainty” be ranked as a “moral being” in the sense of being capable of reflecting on his actions or motives, and of approving or disapproving of those actions (135). But the content of human moral thought was not specified in a metaphysical formality.

Darwin wanted to show that moral sentiments existed among the wildest “barbarians”—repellent to civilised Englishmen though their code of conduct may have at times seemed. Moreover, if one were to pursue this to its conclusion, then what room could this leave for the conceit that our powerfully-felt convictions about what was “wrong” and “right” sufficed to prove that man reigned alone in a zoologically impregnable citadel permanently and high above the beasts? If murderous bees could be construed as acting out of “sacred duties”,
then the possession of moral sentiment was hardly the Rubicon that no brute would dare to cross. The Rubicon, Darwin was claiming, didn’t exist at all.

“No one would think of interfering” with the infanticidal duties of the bees! How stark a proposition this actually was, and so I will argue, continues to be, can be gauged in part by reflecting on how some of Darwin’s contemporaries—including his own loyal supporters and champions in public and scientific life—struggled with the task of re-considering the place of man in nature’s order in the light of Darwin’s assertion of our branching descent. This is the project of the case studies in the following chapters, which look at how a number of thinkers after Darwin did this, and what conclusions they drew about the human species.

These acts of reading can themselves be seen as a kind of contest or struggle for existence, or perhaps as it might be better stated, a struggle for the meaning of human existence. Some philosophers have suggested that by adopting the kind of orientation to inquiring into the human species urged by Darwin’s theory of descent with modification, we enter morally troubling terrain (Himmelfarb is a well-known and hostile example; for an extreme case, see, e.g. Weikart—Weikart has gone so far as to claim categorically that “Darwinism” is pernicious and devalues human life). Others, reflecting that a Darwinian view of morality as a product of an evolutionary process does present some genuine challenges for moral philosophy have responded by stressing that values ought not to be derived from facts (e.g. Singer).

Adding to the anxious reception of Darwin’s ideas has been the widespread popular idea that Darwin’s conception of evolution coupled with evidence from genetics privileges individual competition as above all else driving evolutionary change. (This is often coupled to the assumption that evolution, in a simple and naïve sense, optimises organisms with respect to their fitness for their

4 The phrase and sentiment here is borrowed from the philologist Friedrich Max Müller, who had claimed in his Lectures on the Science of Language (1861) that “language is our Rubicon and no brute will dare to cross it.”
environment. For a critical take on the limits of this view, see Griffiths and Wilkins 2015.) Darwin himself believed that evolutionary change could be effected not only by individual selection, but also by the operation of selection at a group or community level (Darwin 2004, Richards 2009). David Sloan Wilson has recently suggested that the so-called “problem” of how altruistic behavior could evolve in organisms when actions come at the high cost of reducing their reproductive success is not really a problem at all, but an artifact of the way orthodox debates have been framed within population genetics (D.S. Wilson 2010). Wilson suggests that once biologists had accepted that the selection of individual alleles cannot occur for the good of groups, they needed to seek alternative theoretical frameworks to explain other-oriented behaviours in individualistic terms. Theories like inclusive fitness (Hamilton 1964) and reciprocal altruism (Trivers 1971) could purport to explain how altruistic acts and some socially directed behaviours could evolve in and persist in populations while maintaining this theoretical framework. In reality, however, Wilson argues that these frameworks were describing a form of group-level selection, not an alternative to it.

Ways of talking in science—theoretical frameworks, metaphors or heuristics—may easily escape the local confines of the scientific contexts or debates in which they were first applied. Lily E. Kay has argued, for example, that the idea of the genetic code as a “language” providing information was initially a productive metaphor, but it soon became more—it became a “rich repository for the scientific imaginaries of the genetic code” (Kay 2000, 2). The genetic code came to be seen as language: a literal book of life. Another powerful metaphor that has been applied in evolutionary biology in a way that often slides from analogy to identity is that of an economy of nature. Michael Ghiselin (Ghiselin 1974) is linked with what is perhaps the most strident twentieth-century statement of this idea, but Darwin used the phrase too, writing in his D notebook that “one may say there is a force like a hundred thousand wedges trying force … every kind of adapted structure into the gaps … in the oeconomy of Nature” (D135e, 375).
These kinds of difficulties worry many philosophers, who fret that without care for the proper limits of metaphors or instrumental formulations, scientists can intrude without warrant into arenas beyond their legitimate scope. Mary Midgley, for example (Midgley 2011), has scolded so-called ‘scientism’, and warned against

[the] hasty use of certain patterns that have been found useful in biology to explain human affairs where they have only a somewhat artificial application, at the expense of the directly relevant study of human motives (Midgley 2011, 124).

Metaphors, and the difficulties in controlling them, will be an important theme in this study.

1.2 On the particulars and significance of Homo sapiens

All of the writers I examine in this dissertation have taken an interest in the significance of humans as moral or ethical beings or agents.5 This was one of the enduring themes of Darwin’s own work, and we must careful that we do not begin by assuming that Darwin himself felt, even as he penned the Descent’s mostly bold statements, that he was expressing or endorsing a view of human nature that ultimately led to the claim humans were amoral.

Yet we also need consider our capacity for moral reflection alongside another important trait of the human species: our extraordinary capacity to manipulate and change the nature of the environment in which we exist, which in turn alters the circumstances to which our moral codes must then respond. Our human moral canon does not and cannot refer to an absolutely fixed or given set of principles (see, e.g. Sterelny 2012). It is contingent. This was at the front of mind for the writers in my study.

5 At the moment, I am using the terms ‘moral’ and ‘ethical’ interchangeably, in their common-sense way, as referring to “rules, principles or ways of thinking that guide, or claim to guide, the actions of a particular group” (Singer, Ethics [1994], 4).
Nonhuman animals can effect surprising changes in their immediate physical environments, but there can be no doubt that the human capacity to do so has proven extreme in degree. Underscoring the complex and intensifying feedback loop between human environmental modification and social adaptation, and the human moral codes, the environmental ethicist Ronald Sandler reminds us that “technologies capable of modifying or augmenting human capacities are rapidly increasing in power, and their trajectory suggests that it is not premature to address ethical issues associated with human enhancement, and even, the creation of transhumans” (Sandler 2012, 158–9). Global climate change is “an anthropogenic ecological crisis, and species extinctions are at the core of it” (2012, 55). Homo sapiens, of course, does not as a species stand outside the nature we radically modify: a naturalistic account places humans as merely one, among millions, of evolved species. It is my claim that the root of many, if not most, Darwinian controversies stem from what flows from this particular fact, and from the struggle to reconcile these consequences with our experience of ourselves as uniquely human. E. O. Wilson (1998) has characterised this as a conflict between the view that humans are somehow a special case of being exempt in important ways from the constraints imposed on all other beings—“the guiding theme of Western civilization” ([1998] 2006, 310)—and our naturalistic self-image.

The theory of descent with modification certainly undermined many of the traditional kinds of arguments on which claims of our distinct difference from all other species had been founded. Contemporary thinkers like Sandler have argued from this that there is no “unique role” for Homo sapiens in the “scheme of the universe” (Sandler 2012, 158). Yes, our species really is biologically different, but that is not sufficient to establish a “nonarbitrary basis” for special moral status (161). In fact, no individual species, Sandler argues—including Homo sapiens—has an interest-based objective final value. This is a rather different perspective to those who have argued for the extension of moral consideration to nonhuman animals precisely because they assume that many living things have identifiable
interests and in some cases, biographies that accord their lives intrinsic value (Rachels 1990).

In the wake of the publication of Darwin’s theory of evolutionary ancestry, the philosophical questions that emerged were very much concerned with its implication for human value and human interests. These questions that deeply occupied writers like Huxley, Engels and the Russian naturalist Peter Kropotkin, flowed from what they believed that the Darwinian account of ancestry suggested about the nature of man. Such questions were also driven by the century’s broader scientific investigations in the nineteenth century that were revealing much more about the operations of natural laws at all levels of a vast cosmos. Huxley, Kropotkin and Engels all emphasised this, as did the Darwin ally and physicist John Tyndall (Tyndall 1874). As Ian Hesketh has put it, “cosmological, geological and archaeological discoveries were thrusting the origins of life deep into the past” (Hesketh 2015, 199). Hesketh points to how scientific theories in thermodynamics emerging from the 1850s, for example, came to suggest for some that all living things including humans would necessarily pass away under the aegis of enduring physical laws. For Huxley and Tyndall, writing later in the nineteenth century, these ideas would come to be seen as casting doubt over previously imagined futures (Huxley [1894b] 2009b).

How, in this cosmic context, might a naturalistic conception of the development of mind, emotion or moral sensibility corrode long-cherished notions and beliefs about what constituted human essence, human virtue and human value? What might this mean for human societies? Could a natural process—“a temporal and gradual transmutation of one species into another” (Wilkins 2009, 102)—ever be a guide to how we should behave, or to social or political organisation? Was it even the right way of thinking about it, as Huxley once wondered, to try to reconcile the “natural” rights of, say, an individual, carnivorous tiger with the concept of moral right that had emerged through—and indeed symbolised (for Huxley)—human intelligence and social order, formed through intimate if fragile
bonds which held humans together? Were the rights of the tiger and the rights of men the same sort of thing? Huxley thought not (Huxley 1890a).

The ethical theory Huxley laid out at the end of the nineteenth century, was a product not primarily of his Darwinism, but of his epistemological commitments, and in particular, of his agnostic view of knowledge. One of my aims in this dissertation will be to underscore how far important nineteenth-century thinkers—including Darwin himself—were from being able to formulate statements such as “individual human beings cannot have special moral status derivative upon the objective final-value-based moral status of Homo sapiens” (Sandler 2012, 166), or from being able to picture, as Edward O. Wilson could, the possibility of being able to decipher the human moral canons by “interpreting the activity of the emotive centers as a biological adaptation” (E.O. Wilson 2005, 563).

1.3 Accounting for moral sense: the significance of Darwin’s theory

It is commonly assumed that Darwin’s importance rests on his having formulated “the” theory of evolution. In this textbook gloss, there was Lamarck, with his implausible ideas of animals evolving through inheritance of acquired character then there was Darwin, who set us more or less right, gave us Evolution as we largely know it now, and put us in our place, dealing, at the same, time a crushing blow to theology. There is much, of course, that is wrong with this well-known rendition—and Lamarck was hardly the only one other than Darwin to argue that species were not fixed (e.g. E. Darwin 1794, Chambers 1844; and see also Desmond 1983, Mayr 1982, Preece 2006, and Wilkins 2009). Nor was Darwin the first to ponder the mysteries of mentality in animals and to draw attention to their parallels and similarities to the human mind (Locke 1689/90, Hume 1739; and see also R. Richards 1987, Preece 2006). Authors of many philosophical and political persuasions and temperaments, including those following in the sensationalist and associationist traditions of John Locke, David Hartley and David Hume, had been prepared to grant (even if in qualified or limited ways)
that animals had ideas and feelings, imagination, reasoned, and could anticipate the future. Hume had certainly thought so. In 1822, for example, the Scot John Fleming, a minister and zoologist of the natural theology school, argued, in a Humean vein, that “memory, in the lower animals, likewise performs its operations in the same manner with us, by the help of what is termed the Association of Ideas. Thus we have seen a spaniel exhibit all the ecstasy of joy when he observed his master put on any article of dress which he was accustomed to wear during the hours of sport” (Fleming 1822, 220–221). Imagination, Fleming thought, “certainly exists” in the lower animals, although he doubted this could be traced with certainty, due to the “imperfect communication which subsists betwixt us and them” (224). Darwin had certainly read Hume’s discussions on reason in animals (Huntley 1978), and noted Fleming’s ideas about reason and instinct (R. Richards 1987).

There were also others before Darwin who had ventured in pursuit of a natural account of the mind. In 1829, the political radical and medical educator George Darby Dermott had argued that mind was both organic and material (Dermott 1828). He suggested that animals had an intelligence corresponding to human intelligence. But Dermott maintained a role for the soul, with an evasive dualism that enabled him to take an agnostic position on its nature. It was impossible to say what a soul might be, Dermott argued, because it was radically non-identical to the material body and mind—but to speculate was moot because the soul would express its true nature only after death.

The idea, then, of an effective distinction between human and animal intellectual abilities had been challenged long before Darwin. Robert J. Richards (1987) persuades me that what most clearly marked Darwin’s theory of common ancestry as both radical and significant was that it offered a plausible account of the gradual development of the human moral sentiments that did not need to postulate, as Richards puts it, “divinely contrived saltations in human mental and moral development”—a possibility Darwin’s own friend Charles Lyell did not preclude in Antiquity of Man (1863). Nor did the Darwinian hypothesis on
common ancestry suggest an explanatory need for a soul. For thinkers in the later
nineteenth century, preoccupied with matters of political, social and spiritual
morality, all this raised profoundly confronting questions. “Can animals make
moral judgments as we do?” Or, inverting the question, more pointedly, “Is man
essentially no more moral than a rutting pig?” (R. Richards 1987, 109) Even Alfred
Russel Wallace could not, in the end, see how natural selection could ultimately
account for the human mind. Wallace came to believe that “a superior
intelligence has guided the development of man in a definite direction, and for a
special purpose” (Wallace 1870, 359).6

Darwin made his gradualist account of the development of the moral sentiments
central to his discussions of human descent. He knew only too well that it was
the moral sentiments that were widely considered a final bulwark against the
slide to the admission that we were no more than a particular case of beast.
Darwin realised he was indeed proposing a whole new basis for psychology
(Darwin 1859), and he would need to convince his readers that it was
scientifically plausible that the origins of human moral behaviours and
sentiments could be identified in the so-called lower animals, and could have
evolved from them by natural processes of gradual change over time. He needed
to show that no other theory, in fact, was so well matched to the objective facts
describing the structure, development and expression of emotions in humans
and in animals (Darwin 1871 and 1872).

1.4 New dilemmas and the human feedback loop

Still, if we are certainly a species capable of the sort of reflective behavior that we
term a moral conscience, we are also, as Karl Marx and Friedrich Engels stressed,
a species simultaneously conditioned by, and conditioning, our own material and

6 A number of prominent evolutionary biologists much closer to our present, notably Gould, have continued to
resist the idea of generalising from, for example, the genetical explanation of kin selection in animal societies to the
moral codes of human beings (Gould 1976).
social environment. There is currently, among philosophers of biology and comparative psychologists, considerable emphasis on and interest in how feedback loops between social and material culture may have driven changes in human behaviour and cognition (Klein 2009, Sterelny 2012, and Suddendorf 2013).

David Hull (1989, 16) argued that we cannot leap unwisely from the observed facts of evolutionary homologies or general characters to claims that humans are, as a biological species, “essentially the same”. Put simply, on Hull’s view, you can’t get to human universals via the evidence from modern biology, because while the genealogical boundaries of our species seem (currently) quite sharp, when it comes to the character of our species, “we’re polytypic”. One doesn’t need to endorse Hull’s strong version of this claim to take the general point. Paleoanthropologist Richard Klein (2009) points out that cultural innovations can accumulate far more rapidly than genetic ones. Tim Lewens has also pointed to the dubiousness of the view—most notably prosecuted by the so-called Santa Barbara school following the evolutionary psychologists Leda Cosmides and John Tooby—that human capacities are explained largely as adaptive responses shared by all human minds, fixed in our evolutionary past, and generally resistant to manipulation by social reform (Lewens 2007). As Sterelny (2012) argues, what is perhaps most notably human is our ability to accumulate, utilise and pass on technological competence and cultural learning. We use this to modify our environment—but we also adapt through culture and technology to this modified environment. Significantly, Sterelny does not try to tie the human evolutionary process to a specific or single historical event (such as the acquisition of language, or the arrival of cooking). No one innovation “made us” the species we are. Suddendorf gives this way of thinking a further, explicitly cognitive, dimension. We “bolster our scenario-building minds with ever more refined machines and technologies that allow us to measure, model and control the world in increasingly powerful ways” (Suddendorf 2013, 282).
1.5 Beasts of steam, borders of animality

Friedrich Engels, in the nineteenth century, placed material technology and the human ability to manipulate nature through our ‘scenario-building’ minds squarely at the centre of his application of evolutionary ideas to the theory of dialectical materialism. For Engels, the defining difference between the human and the animal was “dialectical thought”—the investigation of the nature of concepts was “only possible for man”, as he wrote in the cluttered notes that were published after his death as Dialectics of Nature (Engels 1941), 203). But the clarity of our apprehension of what the world was 'like', according to Engels, had been obscured and distorted by the industrial mode of production.

The intensification of industry was, of course, the significant social issue for nineteenth-century Europe and England, affecting every facet of human life (and the lives of countless animals as well). It is noteworthy, therefore, that a real sense of the brutal materiality of the industrial revolution (of the sort which inspired from Marx a striking evocation of the industrial machine as a living system in Das Kapital) is often curiously absent in the literature looking at the historical origins, development and emergence of Darwin’s ideas. As Desmond and Moore have put it, the “textual analysts and historians of disembodied ideas—of intellectual ghosts—have carried the day” (Desmond and Moore 1992, xviii). Their influential although not uncontroversial study of Darwin was an explicit corrective: they wanted to pluck a cloistered and tormented Zeus from his Mount Olympus in rural Kent, and re-situate him in his age as part of an “active Whig circle” during an era in which “the Whig government was building the workhouses and the poor were burning them down” (xviii).

One theme in this study is how Darwin’s explanation of human descent intersected with ideas about the value of science as a means of human progress. For Huxley, for example, the goal of scientific knowledge was inseparable from that of human moral progress and social good. Huxley did, of course, understand that Darwin’s ideas overthrew many widely held historical dogmas about the so-
called lower animals. He had no doubt that “sooner or later, we shall discover the remains of our less specialized primatic ancestors in the strata which have yielded the less specialized equine and canine quadrupeds” (1892, 34). And he certainly agreed (with Hume) that mammals and birds were to “be reckoned creatures that have feelings analogous to our smell, taste, sight, hearing, touch, pleasure and pain” (31). Yet the human cause was always, for Huxley, the central one, and his practical principles and ethical theories reflected this. Man may have been descended from the brutes, but Huxley soothed readers of *Man's Place in Nature* that man was not of them (Huxley 1863a): he still stood importantly at the head of this re-framed nature. It was a place humans continued to occupy throughout Huxley’s writing.

Unless the fanaticism of philozoic sentiment overpowers the voice of philanthropy, and the love of dogs and cats supersedes that of one’s neighbour, the progress of experimental physiology and pathology will, indubitably, in the course of time, place medicine and hygiene on a rational basis (Huxley [1887] 2005, 123).

The humanism of the nineteenth century, of course, throbbed and pulsed to the energetic machinery of this altogether new and man-made nature. Even so, the visceral realities, the smells and sounds, of the surging age of steam surely threw into even sharper relief anxieties about the boundaries between humans and brutes. The England, in which Darwin, cosseted in the hills and woodlands of Downe and Keston, delved into the reproductive powers of barnacles, was simultaneously the England where Engels would pen his great social study, *The Condition of the Working Class in England*, first published in Germany in 1845. In this work, Engels painted an unvarnished picture of degraded human beings viscerally close in their conditions of living to the animals that frequently shared their basements and bed chambers: in the great industrial towns “no hole is so bad but that some poor creature must take it” (Engels 2009, 93). In Manchester and the towns of industrial Lancashire, Engels found sixty-year-old men living in the stables of cows, and children sleeping heaped on straw in a “rookery”,

“penned in as if with a purpose”, or “[swarming] about … filthy as the swine that thrive upon the garbage heaps” (98). Engels’s seminal sociological study did not make its way into English translation and publication until almost half a century later. But in the pestilent places he described in the 1840s, the Malthusian message found its material expression—and the truth of man’s animal nature was far from an abstract proposition. Little wonder that the questions being asked in the wake of Darwin’s theory of human descent were being phrased anthropocentrically. This golden noon of Victorian England was also a time when a “bestial science” such as Darwin’s might seem as though it was a “criminal betrayal” of the men of his social class—bringing them closer not just to the state of animals but to the moral state of all other men, and giving aid to the cause of “socialist levelers” (Desmond 1994, 219). While London erected glittering monuments to science and to reason, the working classes—less powerful, but far more numerous, toiled, sweated, and starved in their grim, long shadow. This was England as evocatively portrayed by Dickens: a teeming mass; poverty abutting stupendous wealth; a new and unprecedented kind of slave powering industry and empire—but everyone’s prospects leveled by the ever-present possibility of being carried off to an early grave by a random fever—or worse.

The universality of suffering and pain was a central theme in Huxley’s ethical philosophy. Darwin, Huxley perceived, had naturalised suffering as the condition of all life. And yet, Huxley did not argue from this, as some later twentieth-century figures like Peter Singer would, that there was a need to extend the notion of moral community to nonhuman animals in a way that would see them as having equality of interest. Acknowledging that mammals and birds were certainly to be granted that they felt pain and had senses, Huxley cautiously added “I should be disposed to extend this analogical judgment a good deal further” (Huxley 1892, 31, my italics). Darwin himself took the judgment far beyond analogy in his own later examinations of expression and emotion in animals. “Analogical”? Huxley’s use of this word is suggestive. Darwin had placed human and animal mental development on a gradualist continuum. Why was Huxley, Darwin’s friend and partisan in the evolutionary cause, here cautious? I
suggest it was the same belief about the limits placed on our epistemological access to the world that led Huxley to reject the claims of the materialists, and to doubt that science could ever explain the phenomenon of consciousness, or lead us to know other kinds of minds or experiences.

I do not doubt that our poor long-armed and short-legged friend [the orangutan], as he sits meditatively munching his durian fruit, has something beyond that sad Socratic face of his which is utterly “beyond the bounds of physical science” ... the feelings of sweetness and of satisfaction which, for a moment, hang out their signal lights in his melancholy eyes are ... utterly outside the bounds of physics (Huxley 1892, 167).

1.6 Darwin’s homologies, or, feeling like a beast

By the time he wrote the Descent and the Expression, Darwin was arguing not analogically, but homologically, in both the biological and linguistic applications of the term. Darwin was not saying that either sexual selection in beetles or the “law of battle” (Darwin 2004) in mammals were phenomena analogous to similar phenomena in humans. He was saying that they were the same thing. The difference between the mental powers and qualities of men and those of animals was not a difference in kind, but of degree, as he famously put it in the Descent.

Darwin’s homologies went beyond the physiological structures that Huxley the comparative anatomist had skillfully and convincingly set out as incontrovertible evidence of the common ancestry of humans and the anthropoid apes (Huxley 1863a and 1863b). Huxley had enlisted evidence from skeletons and embryos to demolish the anti-transmutationist claims of the famed and powerful Victorian anatomist Richard Owen. Owen had argued that human beings uniquely possessed a structural feature of the brain dubbed the “hippocampus minor”—and that this justified placing man in a unique zoological order of his own, distinct from primates and all other animals (Owen 1857). Owen’s position simultaneously denied the possibility that apes could transmute into men, and
allowed him to claim a special destiny for man as ruler over nature and lower animals.

Darwin, however, and particularly in his later works, penetrated beyond the skeleton and form, and deep into the expressions of the living organism. Sex exerted a significant evolutionary force—his theory of descent crucially depended on the reproductive choices exercised by mammals, birds, and insects. He linked the human love of beauty to the courtly mating flourishes of birds (E. Richards 1983). He found the rudiments of human sexual behaviours, too, in the “considerable perceptive powers and ... strong passions” (Darwin 2004, 345), mandibles, and stridulations of sexually aggressive and jealous beetles. Even those qualities and capacities held up by metaphysicians over the centuries as irrefutable evidence for the god-granted uniqueness of human nature were not immune from Darwin’s gaze. Darwin put together a speculative theory of the natural origins of human religious feeling drawing on the superstitions of savages and the instinctive fear a terrier had shown upon encountering a parasol animated by the wind.

Darwin saw human terror and human rage in the fear and fury of dogs, and the sleepy child in the yawn of the infant orangutan. The French philosopher of science, Georges Canguilhem once mused that to do mathematics, “it would suffice that we be angels. But to do biology, even with the aid of intelligence, we sometimes need to feel like beasts ourselves” (Canguilhem 2008, xx). Darwin, in the 1870s, was far from the angels, and immersed deeply and sympathetically in the feelings of beasts—including worms. To feel like a beast, one had to throw aside comforting notions, like the idea that humans were made by an act of special creation. Polygeny—the theory that held that the races of men were in fact many species separately created—was another notion that had to go. One of Darwin’s numerous correspondents had told him that on “the eastern coast [of Africa] the negro boys when they saw [the explorer Richard] Burton, cried out ‘Look at the white man; does he not look like a white ape?’” (Darwin 2004, 646)
Assigning man his proper place in the zoological series was, Darwin conceded, likely to be “distasteful” to many (689). But the acknowledgment came with a sly challenge to readers who might pretend to have the inquiring and scientific temperament so highly prized by the Victorian age (Secord 2014), and yet deny in principle the possibility of the common ancestry of men and apes. Was it not, Darwin suggested, more in the character of a “savage” than of a “civilised” man to turn away from truth in fear? Darwin urged, rather, following the kind of methodological habit of investigation prescribed by John Herschel in his Preliminary Discourse on the Study of Natural Philosophy (1830). The proper scientific temperament necessitated objective and bold examination of the empirical facts, set against an assumption of a regular, law-bound nature. False facts, Darwin wrote in the Descent, were more injurious to the progress of science than incorrect theories, for “they often endure long”. But false views, “if supported by some evidence, do little harm, for every one takes a salutary pleasure in proving their falseness; and when this is done, one path towards error is closed and the road to truth is often at the same time opened” (2004, 676). It was typical of the way Darwin had come to argue, by a subtle process of psychological challenges, unstated implications, and wedges. Darwin’s rhetorical strategy, in the words of Richards, was one of corroding barriers “by insinuation and barely visible logic” (R. Richards 1987, 199). Wrote Darwin, making the terms of his challenge plain: “He who is not content to look, like a savage, at the phenomena of nature as disconnected, cannot any longer believe that man is the work of a separate act of creation” (2004, 676).

1.7 Why common ancestry?

I have a specific intent in mind by focusing in this study on the broad idea of common descent. Many historical surveys of Darwinian thought, and numerous philosophies of biology, have tended to emphasise an individual natural selection as the central or even the defining element of Darwin’s thought. Evolutionary psychologists, not always uncontroversially, have placed sexual selection at the centre of their picture of human psychology (e.g. Wilson and Daly 1992, Buss
2009). And in many popular renditions of Darwin’s ideas, that persistent but highly charged and frequently misunderstood phrase “survival of the fittest” often functions as a *leitmotif* for natural selection and stands in for Darwin’s thought.

I don’t doubt Darwin’s unwavering belief in the selective power of competition between and within species for resources, nor in the power of sexual selection as playing an explanatory role for a range of phenomena from sexual dimorphism to the appreciation of beauty (Darwin 2004). I make the point above about the emphasis frequently placed on selection and competition though, because as Ernst Mayr (1984 and 2004) and Tim Lewens (2007) note, natural selection is just one of the components of Darwin’s overall conception of evolutionary change.

Darwin himself placed a different emphasis on these components at different times. However, the idea of evolutionary common descent was both antecedent and fundamental to the other components. Darwin had, after all, come via his growing certainty that all species were commonly descended, by branching off from progenitor forms, to the idea that this occurred in large measure through the process he termed natural selection. Natural selection had enabled him to conceptualise descent in the way with which we are now so familiar (and often represented as a tree—see, e.g. Depew and Weber’s 1995 discussion of Ernst Haeckel’s famous tree of human pedigree, p. 179–80)—although Darwin had early on imagined at least one alternative metaphor, coral (B25, I77).

Common ancestry was also, I will argue, a crucial aspect in the social and cultural reception of and discourse around Darwin’s work, reverberating powerfully in popular representations and discussions of his ideas—where the Ancestor loomed large in the figure of the Ape. “The Darwinian theory,” noted the *Literary Churchman* in 1860 (October 16 1860, 393) “would lose half its interest with the public if it did not culminate in a doctrine on the origin of human species, and one of the most attractive features recently added to geological investigation is the discovery of human remains supposed to be of a period anterior to which we
date man’s beginnings.” Huxley (he was not alone in this) was never prepared to grant more than provisional approval to the hypothesis of natural selection, doubting the strength of the argument presented in the Origin. Yet he had no qualms about agreeing with Darwin that humans are the product of an evolutionary process, “in substance and in structure, one with the brutes” (Huxley [1863a] 2001, 114).

In later works, notably, The Expression of the Emotions in Man and Animals, Darwin himself had turned his attention from the theory of natural selection and its role in the formation of species to his broader project of developing his naturalistic account of human emotions and mind. Here, he allowed that some of our expressions could be now functionally neutral, and thought that “some actions, which were at first performed consciously, have become through habit and association converted into reflex actions, and are now so firmly fixed and inherited that they are performed, even when not of the least use …” (Darwin 1872, 39). He absorbed himself in the behavior of earthworms. He thought there was no a priori reason why the actions of worms in plugging up their burrows could not have been explained either by inherited habit, or by the inheritance of “beneficial variations of some other habit” (Darwin 1883, 94).

Darwin had been playing with the idea of pangenesis as an explanatory mechanism of inheritance. Certainly, some of his later ruminations had what could be considered a “Lamarckian” flavour, in that they allowed for heritability of habits (Richards 1987, Burghardt 2009, Ekman 2009). But with Robert J. Richards, I agree it is implausible and ahistorical to interpret this sort of thought as though a simplistic case of retreat away from natural selection to a Lamarckian view, as Himmelfarb (1959) claimed. It was only later in the century, in any case, that Darwinists began to insist on a strict split between what were after that supposed to be radically incommensurate kinds of explanation (Depew and Weber 1995).
What is clear is that Darwin did question the total adequacy of natural selection’s explanatory force. In the *Descent*, he wrote that the power of his “former belief” that each species had been purposely created which had “led to my tacit assumption that every detail of structure, excepting rudiments, was of some special, though unrecognised, service” (Darwin 2004, 81). By the sixth edition of the *Origin*, in 1872, Darwin could argue that the origin of a prehensile tail in American monkeys needed no more explanation than that it emerged from a beneficial habit. In *The Variation of Plants and Animals Under Domestication*, he made the case that modifications of the structure of organisms could be effected by the direct action of the environment, albeit that this played in most cases a “subordinate part in causing any particular modification; like that which a spark plays, when a mass of combustibles bursts into flame” (Darwin [1868] 1998, vol. 2, 282).

But Darwin’s theory rested ultimately on his conviction that the only explanation for the facts of our structural similarities and developmental similarities with other animals, the presence of rudiments, and similarities in our behavior and expression with those of other animals could be common ancestry. Elliot Sober (2009, 10055) puts it this way: “You do not need to assume that natural selection has been at work to argue for common ancestry; in fact, what Darwin thinks you need to defend hypotheses of common ancestry are traits whose presence cannot be attributed to natural selection”. It is because of common ancestry, Sober suggests, that facts about the history of natural selection become knowable.

1.8 Admitting Darwin’s principle

Not everyone, of course, would admit the principle of common ancestry, and especially as Darwin expressed it. The politically and intellectually powerful Victorian anatomist Richard Owen was one who never acceded to Darwin’s formulation of evolutionary change, committed as he was to the idea that secondary laws or causes governed the orderly succession and progression of organic phenomenon (Rupke 2009). Owen’s theory that species differed within
limits set by unified types and archetypal forms did not allow him to admit of the sort of plasticity or variability of organisation that might have led, for example, to the gradual development through natural selection of something as singular but strikingly functional as the curious middle digit of the aye-aye, a Madagascan lemur (Owen 1863). Owen’s position was a thorn in Darwin’s side and a goad to Huxley (Desmond and Moore 1992); perhaps mischievously, Darwin included Owen in his historical sketch of naturalists who “believe that species undergo modification”, introduced into the third edition of the Origin (Darwin 1866, xiii). By the fifth edition, Darwin was doing some corrective dancing about the nuances of Owen’s views about natural selection, though Owen remained in the sketch (Darwin 1869). A central theme of this dissertation, however, is that even those who did admit Darwin’s principle were not necessarily prepared to follow the idea of common descent to the point that might allow them to face with equilibrium the ethical implications of the idea that the infanticidal bee, could she reflect on it, would be satisfied she had acted in good conscience. There is, even now, a profound tension between this implication of Darwin’s thought and the goals of moral philosophers.

Darwin ultimately came to approach the text of the natural world and the fact of the infanticidal bee with an attitude that was (to borrow an evocative phrase from Gilles Deleuze) neither “renunciation nor resignation” (Deleuze, [1987] 2004). He was seemingly content to allow room for the possibility of a limited kind of progress—and Darwin recognised the power the Romantic imaginary and the Paleyite worldview had exerted over his thought (Darwin 2004, Davies 2009). Yet it is noteworthy that the language in the Descent and in particular, the Expression, as we shall explore further, had shed the poetic garb of the Origin.

Nonetheless, it remains an equally stubborn fact that the view of nature Darwin presented is one of contingency, temporality, struggle, pervasive violence and necessary death (Browne 2003)—even the death and extinction of whole species or communities of men (Darwin 2004) could be borne as compatible with the logic of the evolutionary process. From a psychological perspective, the Descent
and the *Expression* suggested that human morality was a contingent, and perhaps even fragile, affair: not far behind the enraged sneer of the human was the ancestral history binding us to the snarling dog. This view of nature could not but throw doubt on traditional views about human significance. As Darwin would show in his gentle, patient study of earthworms published shortly before his death, even the worms that had poor senses and barely seemed to distinguish light from darkness had slowly leveled the lands and laid the soils on which civilisation depended. Worms, that symbol of the quiet grave and the end of earthly human toils were even so, and without any reference to human ends, a productive force in their own right, turning endlessly and blindly, preparing the ground and soil for seedlings and plants, and protecting “for an indefinitely long period every object, not liable to decay, which is dropped on the surface of the land, by burying it beneath their castings” (Darwin 1883, 311–12). Not only did that ancient form outlive great human empires; pointedly, it preserved them for posterity. Archaeologists, Darwin thought, should be grateful to these “lowly organised creatures” which have “played so important a part in the history of the world” (Darwin 1883, 316).

Darwin consistently pointed his readers to man’s vanity in assuming himself to be at the pinnacle of nature. With typical dryness, Darwin took the zoological perspective to erode the conceits: “If man had not been his own classifier, he would never have thought of founding a separate order for his own reception” (Darwin 2004, 176). Man might have been “the wonder and glory of the Universe”, but this apparent compliment was delivered with a slap, since “[u]nless we wilfully close our eyes, we may, with our present knowledge, approximately recognise our parentage” (193, my italics).

But Darwin’s life had, after all, been dedicated to observing and reading the expression of all living things. He rested content that “the most humble organism is something much higher than the inorganic dust at our feet; and no one with an unbiassed mind can study any living creature, however humble, without being struck with enthusiasm at its marvellous structure and properties” (193).
CHAPTER 2. ANCESTRAL TEXTS

2.1 On reading Darwin

Ancestral texts, like the past in which they were generated, are neither linguistically nor epistemologically transparent to us. It is hard to read Darwin, let alone to read about Darwin, without becoming aware of the many different kinds of transactions and exchanges that take place in the act of reading, and to become conscious of the several things it means to say, “I read”. But even acknowledging this is not sufficient to reveal all the assumptions we bring to the act: reading is both a conscious, and unconscious, enterprise. Moreover, Darwin writes in a way such that the text is not always as it seems. Silence is articulate in Darwin’s work. Consider the following three statements composing a paragraph from the Descent of Man (my italics):

(1) “There is no evidence that man was aboriginally endowed with the ennobling belief in the existence of an Omnipotent God.”
(2) “On the contrary there is ample evidence, derived not from hasty travellers, but from men who have long resided with savages, that numerous races have existed, and still exist, who have no idea of one or more gods, and who have no words in their languages to express such an idea.”
(3) “The question is of course wholly distinct from that higher one, whether there exists a Creator and Ruler of the universe; and this has been answered in the affirmative by some of the highest intellects that ever existed” (Darwin 2004, 116).

In this paragraph the effectiveness of Darwin’s argument hinges on a number of things that he does not say. Darwin starts with a statement expressed in the negative: There is “no evidence” that all races of men aboriginally believe in an omnipotent god. Framing the statement in the negative entails, without Darwin needing to state this, a positive expression of that thought: ‘There is a widespread, or at least common enough, view that belief in an omnipotent god is innate and universal among men’.
Darwin follows his statement that there is “no evidence” for such a view with the statement that there is “ample evidence” of races that do not possess the idea of one or more gods, and further, do not even possess the language for it. This formulation presses his point home at the risk of being circular (since you can’t have meaningful words for something that you can’t conceive of). Further, writes Darwin, *this* evidence has empirical foundation: it comes from not from “hasty travellers” but from “men who have long resided with savages”. What he does not supply here, but evidently invites the reader to complete, is a statement that might conclude something like: “and who have therefore the authority for making such a claim, rather than a shallow acquaintance with the matter”.

Finally, Darwin adds a third dimension of argument: that “the question is of course wholly distinct” from that higher one, ‘Is there a God?’ (“of course” here playing a strategic rhetorical function). Darwin answers this question with ‘the philosophers tell us it’s so’—deferring the responsibility for that claim, with an ironic rhetorical shrug, to the “highest intellects”, whom, Darwin assures the reader have “answered in the affirmative”. Darwin has no need to, and indeed pointedly doesn’t, offer his own assessment of their answer.

In this passage, Darwin invites the reader, by means of these articulate silences, to weigh the “ample” empirical evidence furnished by firsthand experience supporting the claim that belief in (a) god(s) is not universal, against the assurance of the “intellects” that God exists. Implicit, though not stated, is the value ascribed to empirical evidence over speculation. Having set the scene with this form of argument, Darwin then needs only to describe how it is possible to form a cogent and plausible naturalistic account of the origins of man’s belief in “unseen spiritual agencies” (119). Sticking to empirical grounds, and scrupulously evading the metaphysical questions that he well knows he has invited, he throws into doubt, without explicitly denying, the authority of the metaphysicians’ speculative claims.
This is a style of argument frequently used throughout the *Descent*. Darwin’s language can seem straightforward, yet there is an elusive quality to his argument. Alan G. Gross has examined the evolution of Darwin’s evolutionary arguments, beginning with an intricate rhetorical and stylistic analysis of Darwin’s notebooks, and in particular, his *Red Notebook* (Gross 2006). Gross’s analysis begins by treating Darwin’s entries in his notebooks as a special form of literary genre, in which the audience is Darwin himself. He shows how the notebooks can be read to reveal something of Darwin’s own mental processes as he struggled to formulate his theory of ancestry. He argues that the status of Darwin’s knowledge is characterised in the notebooks by marked “epistemological fluctuation” (82), in which his cryptic style displays an absence of logical connectives, and radical deviation from ordinary syntax and punctuation.

Speculate on neutral ground of 2 ostriches; bigger one encroaches on smaller.—change not progressif:<e>:produced at one blow: if one species altered ...Mem: my idea of Volc: islands. elevated. then peculiar plants created. (Barrett et. al. 2008 *Red Notebook* 127, p. 61, quoted in Gross 2006, p. 83).

Gross reads this style, with its lacunae and its uncorrected errors, as part of a drama of self-persuasion, with the style and content “in close touch with primary mental processes” (97). As Darwin’s theory evolves, and he becomes more certain of it, Gross shows the *Notebooks*, too, altering in character, as “isolated facts and concepts coalesce, intertwine and ... unite into more fundamental, law-like statements” (97). This style begins to anticipate public forums—the rhetorical transaction is now not with the self, but begins to emerge as persuading others.

Huxley, with his temperamental preference for clear argument and frank statement, had found Darwin’s manner of arguing in the *Origin* frustrating (Huxley 1859 and 1860). He thought Darwin’s heavy reliance on artificial selection as evidence for claims that an analogous process operated in nature to
be, far from a clinching argument, the weakness in Darwin’s case from a scientific point of view. Perhaps so—but Darwin’s form of arguing suited Huxley’s own interests better than he perhaps admitted. It was, in fact, what Darwin opened up and made possible, rather than what he did or did not prove, that was the enduring value of the *Origin* for Huxley. The *Origin* opened up the possibility of a perspective from which to examine the origins and development of organic life from a basis that did not require metaphysical assumptions or speculation. For Huxley, writing anonymously in 1859 in the *Times*, the main virtue of Darwin’s theory of species origins was that, unlike previous candidate theories, it was at least potentially empirically testable. “If” what Darwin claimed were to be shown “to be so”, Huxley thought, then it would free philosophy once and for all from the snare of those “fascinating but barren virgins, the Final Causes” (Huxley [Anon. 1859] 1893, 21).

The historical picture we often get of Huxley is one of a convinced and ardent Darwinian, persuaded by an idea the logic of which was so self-evident that Huxley only wished he had thought of it himself. In fact, Huxley regarded Darwin’s style of argument with something close to bemusement. The *Origin* was, his anonymous review read in 1860 (in what surely strikes us as somewhat exasperated if not condescending terms), “a sort of intellectual pemmican—a mass of facts crushed and pounded in to shape, rather than held together by the ordinary medium of an obvious logical bond” (Huxley [Anon. 1860a] 1893, 25). Further, Huxley none too subtly admonished that Darwin was actually hampered by his prodigious factual knowledge. This mastery of detail must have been “embarrassing” for a writer when he had only the opportunity to present an “abstract” of his views— and it was exactly this, Huxley suggested, which Darwin failed to execute without ambiguity. Huxley acknowledged the enormous learning that had gone into the pemmican, but facts may be countered with great ingenuity by those determined not to accept them, and Huxley found Darwin’s “pregnant paragraphs” left gaps dangerously open to misrepresentation by his lesser learned opponents: “the novice in biology is apt to complain of the frequency of what he fancies is gratuitous assumption” (1860, 25).
Huxley grumbled against Darwin’s way of arguing throughout his life. He complained in 1888, long after Darwin’s death, that Darwin “gets to the truth by ways as dark as those of the Heathen Chinee” (Huxley to Michael Foster, Feb. 14 1888, *Life and Letters Volume II*, p. 191). He gave further voice to this frustration several weeks later in a note to Joseph Hooker.

I have been trying to set out the argument of “The Origin of Species,” and reading the book for the nth time for that purpose. It is one of the hardest books to understand thoroughly that I know of. (Huxley to Joseph Hooker, Mar. 9 1888, *Life and Letters Volume II*, p. 192)

A few days after that again, he scribbled to Hooker of “becoming confirmed in my opinion that it is one of the most difficult books to exhaust that ever was written. I have the notion of writing out the argument of the *Origin* in systematic shape as a sort of primer of *Darwinismus*” (Mar. 23 1888, *Life and Letters of Thomas Henry Huxley Volume II*, p. 193). As if in his own defence, Huxley implicated others to show that he was evidently not alone in his struggle: Darwin’s friend the biologist and comparative psychologist George Romanes had Darwin “hopelessly wrong”, Huxley fretted (Mar. 9, *Life and Letters II*, p. 192), while Darwin’s American populariser the botanist Asa Gray seemed never to “have mastered the principles of Darwin’s theory”. As a reader, Darwin’s silences, periphrases and evasions left Huxley uneasy. There was something “uncanny” about Darwin, not unlike “a sort of miraculous dog” (Huxley to Hooker, Mar. 23, *Life and Letters II*, p. 191).

### 2.2 Reading after Darwin

Darwin was a reader before he was a writer, and in the first instance, his texts were wordless and speechless: the history of the earth as told by geological formations, or the secret lives of animals expressed not through language but in colour, social organisation, habit, or gesture. He was also engaged deeply in a form of cultural reading. It was necessary to read the temperature of his times,
and the temperament of his audience, as he wrestled to put the words on the page to describe his conception of evolutionary change, and to defend this theory once in the world. Often, he left the latter to others with a greater appetite for the public fray. He preferred the safety of pen and paper. Lastly, there was reading of the more traditional sort: the letters from his voluminous number of correspondents, and the scientific and philosophical works of his time (Greene 1997). Darwin was actually developing his argument not just by amassing his “pemmican” of facts, but through multiple acts of reading.

Reading after Darwin, the problems of text and interpretation are of a different kind. Darwin’s writings are among the most productive in all of literature. They have generated vast corpora of work feeding into every area of human interest, knowledge and endeavour: biology, technology, poetry, film and television, philosophy and psychology, and medicine, to name but a few examples. This pervasiveness creates an immediate (and tangible) methodological and discursive problem for historians and writers. The sheer volume of what has been written about Darwin, and its disciplinary diversity and technical specificity, is one problem that confronts. Another problem is time. The passing of time, and the fact that the past is no stable point of reference, place limits on the scholar’s epistemological access to Darwin’s world. The finite span of any one research program (and ultimately, life) also sets limits around what can actually be read. Literary style and fashion, developments in scientific and technological practice, cultural and prejudices and practices, methods in historiography, technology, and the emergence of stronger and closer voices, can all obscure the historical and material Darwin. This is something that can’t be got around by trying to imagine oneself into a virgin relationship with Darwin’s works. The first encounter with the proposition of the “theory of evolution”, in whatever form and whatever its initial effect (no memorable effect in my case), has come for most of us long before we read (if we ever do read) Darwin’s own words. It is entirely possible, and one might speculate, very common, to identify oneself as a Darwinian without ever having read a word of Darwin’s own writing. It is difficult, when modern readers do read Darwin, to hear that nineteenth-century
voice above the historical and present din of the many claims on its inheritance. Think Darwin without his prodigious present champions like Richard Dawkins, Daniel Dennett or E. O. Wilson, or without those classic figures in the twentieth-century synthesis: Ronald A. Fisher, Ernst Mayr, or John Maynard Smith. How about Darwin without the boardroom slogans of corporatised evolutionary psychology; or Darwin without the overhead whizz of the latest mortars being flung in the You-Tube showdown between Atheism and Creationism. More darkly, Darwin without Hitler?; more obscurely, but also important, Darwin without the algebraic formula for altruism developed by a curious and lonely prodigy, George Price. Imagine Darwin stripped bare of the T-shirts, and the genes. We are inevitably reading Darwin dialogically. But nor is it open to us to approach Darwin’s works as one might a novel or work of fiction. And as Tzvetan Todorov suggests, even when analysing a work of literature, we cannot just impose any order we like upon it. We must choose “among the many possibilities available to us … in the least arbitrary manner possible”, by looking at the relationships between the present, and the absent, elements in the text itself (Todorov 1981, 13). We must also look to the cultural and historical elements in which it is embedded.

The abundance of the ideas in Darwin’s texts requires we at least touch on a slightly different kind of reading problem. It is easy—even pleasurable—to slide from Darwin’s invitingly open texts into speculation, but reading can always lead along byways that ultimately go nowhere. The philosopher Paul Horwich (1998, 53), pondering that much worked-over question “what is truth?”, noted how easily that debate can take on the aspect of “an empty, pointless terminological wrangle”—leaving us wondering if we are examining any genuine problem at all. So it can be, too, with Darwin’s ideas. The biological and psychological sciences have proliferated supposed “evolutionary” explanations for the origins of just about everything, some of which at least seem of dubious value—if not vacuous.

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7 Robert Richards has recently provided a convincing rebuttal of the claim that Hitler himself was in any meaningful way a motivated Darwinian (see Richards 2013). But in some popular representations, usually frankly ideological in character as in Weikart 2004, the link still persists.
A simple search in Google using the term “evolutionary origins of” [...] supplies a long list of terms to populate the ellipses, including: “obesity”; “laughter”; “difference in sexual preferences”; “patriarchy”; “leadership and followership” (sic); “stigmatization”; “your left and right brain”, “religions”; “modularity”, and “organelles” (searched on 7/7/2016). Surely, however much of this is tautological. If all organisms including the human organism are the product of an evolutionary process, then anything and everything might be said in a trivial way to be an “outcome” of that process.

2.3 Literary theory: piss, poeisis and piety

There is a general tendency to speak of “Darwinism”, implying that such a thing exists as a single unified statement, or from a less sympathetic perspective, perhaps even a scientific dogma. Either way, this is speaking as if the content of the term is transparent, obvious and circumscribed. A common rendition of what Darwin is supposed to have done will contain the claim (or something like it) that he “developed” “the theory of evolution”, or “discovered” natural selection. Even a commentator as steeped in the historical discourse as Michael Ruse could slip into such language, with talk of Darwin’s “discovery of a theory of evolution” (Ruse 1973, 53). And as this sentence also indicates, there is often something else consistent in the pattern of this language: “A theory.” “Darwin’s theory.” “Darwin’s (dangerous) idea” (Dennett 1995). It is perhaps more helpful to follow Ernst Mayr, and consider what is called Darwin’s “theory” as a framework made up of several elements (Mayr 1982, 2004, Lewens 2007). Natural selection, usually considered the centerpiece of that theoretical framework, was not itself a tangible “thing” (and perhaps it even less was it a “mechanism”—although it is often so described). Nor could natural selection—as, say, Newton’s laws of gravity could—be expressed via the pristine abstraction of a mathematical theorem which might give it a sense of being something with a quantifiable existence.

If Darwin’s proposition has been widely accepted as “true”, it was not in his time truth of a mathematically calculable sort, although Darwin’s ideas and
mathematics would certainly come to have a lot to do with each other, particularly after Francis Galton, and later, Ronald A. Fisher, who explicitly attempted to “state the principle of Natural Selection in the form of a rigorous mathematical theorem” (Fisher 1930, 22). But for Darwin’s contemporary champion Huxley, that sort of truth was not the point, and “we should leave a very wrong impression on the reader's mind if we permitted him to suppose that the value of that work [the Origin] depends wholly on the ultimate justification of the theoretical views it contains” ([1860] 1893, 78).

From the outset, this meant that Darwin’s conception of evolutionary change posed a number of problems. Darwin had started down the line of investigation that led him to conceive of its several elements by ruminating on a question that had long haunted natural philosophers: Why species? (Browne 2003). By the time he came to write the Origin, he had additional sorts of problems: problems in philosophy and metaphysics, in ontology and epistemology, but most pressingly, a problem of writing and textual strategy. In other words, it was already literary theory. There were levels and layers of problems to be worked through. Some were practical. Darwin-the-experimenter obsessed over how to design an experiment by which you could conclusively show how a form as strictly regular as a honeycomb might have evolved by the slow moulding of the instincts of the Melipona by the selective pressure of a contingent nature (Darwin 1859). One of the biggest and most obvious problems, however, loomed in one word: theism.

While eighteenth-century Enlightenment radicals had made shrewd use of Newton’s laws, wedging them between men and the concept of an interventionist personal deity (Gay 1969), Newton’s own personal God had remained unperturbed by his science (Westfall 1995). Darwin’s explanatory framework for evolutionary change could not be phrased in a mathematical statement. And while Darwin never doubted that nature was law-bound, and even retained according his own admission a form of theistic belief during the formative years of his theory (Darwin 1887), Darwin’s investigations of species origins led him to
a very different aspect on nature—as he evidently understood from the time he opened his private notebooks. This was a messy working-towards—in every sense of “messy”. The notebooks are full of scribbles, amendments, and half-completed sentences that dissolve like bubbles of thought. Nor, it became apparent, was the cause of Darwin’s evolutionary change hidden in the mysterious bosom of god (to borrow a phrase that Voltaire had given to his fictitious eighteenth-century Newton), but in the very palpable bosoms of living women and men, and the creatures with whom they were now being claimed to share common ancestors—even though Darwin avoided, at least in his published works, speaking so indelicately.

The indelicate implications—whether for personal gods or personal sensibilities—were not, of course, lost on his readers. For one American reviewer of the *Origin* in 1860, Darwin’s claim that complex organisms in fact evolved “not by means superior to, though analogous with, human reason, but by the accumulation of slight innumerable variations, each good for the individual possessor” amounted to “neither more nor less than a formal denial of any agency beyond that of blind chance in the development or perfecting of the organs or instincts of created beings”. True, this reviewer said, “a first cause is admitted; but it is with that sort of protest which is suggested where its agency is studiously limited to the least imaginable amount of intervention” (Lowell, 1860, 462). “Mortifying enough,” the reviewer thought, “to be descended from an oyster; but Mr. Darwin is rather of the opinion that we must rest satisfied with a lichen” (463). Without “intending to charge him with approaching the subject with any sceptical intentions,” he pointedly concluded, “we cannot but regret and distrust them” (464).

Even some with a scientific temperament perhaps closer to Darwin’s own drew back from admitting where Darwin’s ideas were really leading. The Unitarian physiologist and William B. Carpenter—once himself suspected of being the anonymous author of the sensational best-selling pre-*Origin* transformist epic
Vestiges of the Natural History of Creation which had appeared in 1844 (Secord 2000) approached the brink and peered over. Queasy, Carpenter shrank away.

“We cannot help thinking,” he wrote, reviewing the Origin in the National Review (Carpenter 1860, 193), “that it might have been better if, in this early stage of the inquiry, Mr. Darwin, like Mr. Wallace, had abstained from that explicit avowal of the ultimate conclusions to which it seemed to him to lead, which will be pretty sure to frighten away many whom he might have otherwise obtained as adherents.” His objection, moreover, was not simply pragmatic or political. He wrote, not without displaying some genteel distaste:

We shall discard for the present all reference to the question whether (as Mr. Darwin thinks probable), men and tadpoles, birds and fishes, spiders and snails, insects and oysters, encrinites and sponges, had a common origin in the womb of time, and shall address ourselves only to the arguments urged by Mr. Darwin and Mr. Wallace in support of the doctrine of modification of specific types by natural selection.

Here, Carpenter felt himself on safer ground. Thus contained, the argument, could be treated in the spirit of impartial scientific inquiry. Not even “the stoutest believers in Mosaic cosmogony” could be dismayed if it could be shown that domestic dogs were the descendants of wild wolves. Yet, even as he defended Darwin, Carpenter worried that Darwin had left himself open to the inevitable accusation that he had reduced “the functions of the Creator ... to the level of a mere Physical Agency” (194).

Had Lowell and Carpenter had access to Darwin’s private notebooks, opened more than 20 years earlier, each may have felt even more reasons for “regret”. Scribbling in his copy of a work by the German physiologist Carl Carus, Darwin jotted, “Good idea. to show life only laws. like universe.” (Barrett et. al. [eds]. 2008), footnote 103–2, p. 270). Following this kind of idea, thought “being a secretion of the brain” was no more wonderful “than gravity being a property of matter” (CI66, 291). If “life only laws”, then the conviction that each individual
species was the object of an act of individual creation was surely a failure of historical and scientific imagination.

There were two aspects to this suggested failure. Darwin could now scoff at the very idea that “God created. (warring against those very laws he established in all ... organic nature) the Rhinoceros of Java & Sumatra, that since the time of the Silurian, he has made a long succession of vile Molluscous animals— How beneath the dignity of him who <<is supposed to have said>> let there be light.— bad taste ...” (D37, 343). How much grander, Darwin continued on, was the “Astronomical” view of things, on which nature unfolded as a product of “causes, modified by unknown ones. cause changes in geography & changes of climate superadded to change of climate from physical causes.—these superinduce changes of form in the organic world, as adaptation. & these changing affect each other, & their bodies, by certain laws of harmony keep perfect in these themselves.—instincts alter, reason is formed & the world peopled ... from a period short of eternity to the present time, to the future” (D36, 342–343).

Darwin here homes in on the idea that it is inconsistent to think that individual species were separately created if all other aspects of the natural world are admitted to be regulated and governed by observable and continuous natural laws that, once set in motion, require no further creative intervention. This discrepancy, Darwin hints, surely casts doubts on the creator's supposed omniscience. However, Darwin's example of “vile Molluscous animals” is also instructive, and his note that such creations must surely be “beneath the dignity” of any omniscient creator suggests Darwin was also sensitive to a somewhat different implication of this line of thought. These words also suggest that Darwin had in mind a problem over which theologians and metaphysicians had tied themselves in eloquent or awkward knots for centuries: the obvious gap between the work of a god widely supposed to be omnisciently creative and beneficent, and brute facts like wars, syphilis, or (in this example), the existence of vile and molluscous animals. Why, it is suggested in this note, go to the lengths of creating such creatures at all? Such passages in the notebooks make it
clear that the emerging outlines of his theory had impressed the significance of this gap on Darwin in a new, and starkly real, way. Despite his astronomical perspective, with its majestic levels of causation, what also emerges from Darwin’s notes during this fertile, febrile period is that his own emerging conception of organisms changing slowly over time didn’t exactly have the sort of aura of purity that had caused Newton’s followers to write paeans to the luminous truth of his laws.8

A remarkable aspect of Darwin’s notebooks, particularly the M and N books, is how immediately physical and frankly visceral his observations about humans and animals are—a frankness discreetly absent from the Origin and re-rendered in cool, objective prose in the Descent. But the notebooks are alive, reveling in the chaotic expressions of animal nature. They are literally beastly. There are “cats kneeding (sic) when old, like kittens at the breast” (M 146e, 556). Jaguars “quarrelling. mouth wide open ... growling, guggling” (M152, 558). The hyaena “pisses from fear so does man” (M153e, 558) or more startlingly, perhaps it “likes smell of that fatty substance it scrapes off his bottom.—... relic of same thing that makes one dog smell posterior at another.—” (M71, 536). “Do the Ourang Outang like smells? ... Have monkeys lice?” Darwin wondered. “Do female monkeys care for men.—” (M156, 560). “In the most perfect fainting, sphincters are loosed is a convulsive action to remove disagreeable impression” (N56, 578). “A man shivers from fear, sublimity, sexual ardour” (N59, 579).

Sexual desire makes saliva to flow <<yes, certainly>>— curious association: I have seen Nina [one of Darwin’s dogs] licking her chops.—... Lascivious women. are described as biting: so do stallions always.= No doubt man has great tendency. to exert all senses, when thus stimulated ... The association of saliva, is probably due to our distant ancestors having been like dogs to bitches.—” (N41, 574)

8 Darwin’s reference to “let there be light” suggested an allusion not only to the Biblical lines, but to Alexander Pope’s celebrated epitaph to Newton:

Nature and Nature’s Laws lay hid in Night:
God said “Let Newton be!” and all was light.
Many of the animals that feature in Darwin’s speculations on ancestry in his notebooks are mammals, and he puts the implications of this closeness of descent beyond doubt. A “stallion licking udders of mare” is “strictly analogous to men’s affect for women’s breasts” (M71, 536). Nor need we “feel so much surprise at male animals smelling vaginae of females.—when it is recollected that the smell of ones own pud. not disagree.—... Seeing dog & horse & man yawn, makes me feel how <much> all animals <are> built on one structure.” (M 85, 540)

Richards has noted that Darwin, “in his nineteenth-century way” thought of natural selection “as comparable to the law of gravity” (Richards 2013, 28). By law, he here takes Darwin to have meant “causal interactions in the natural world that were fixed and of an unchangeable type … a network of radiating forces that governed all organic and inorganic formations” (28). Maybe so, and Depew and Weber (1995) have certainly emphasised Darwin’s commitment to the idea that any law governing the origin of species must also be consistent with his belief in “a world fully governed by Newtonian physical, chemical and geological forces” (Depew and Weber 1995, 66–7). Yet as the notebooks illustrate, this insight can also be rendered in less majestic, rather more pungent and earthy, terms. While laws governed the movements of the planets they also flowed, affect by affect, ceaselessly on and through the pulsing world below them: beating down mountains, expressing themselves through the cycles of leaf and tree, but also through a monkey’s lice, or the bite of lascivious women. The same laws endlessly propagated the morally dubious, the vile and the molluscous—even as they gave form to reasonable, civilised men.

2.4 The womb of time, the worm’s turn

Far removed from the snarling of dogs or the gurgling of jaguars, but equally crucial to Darwin’s speculations on human ancestry, was Time. Time is a brooding character in the Origin—there is something almost chthonic in its call from the deep past, its appeal to the continuity of present things with extinct yet
un-dead ancestors entombed in ancient rock, and finally, all connecting to the relentless geological forces giving slow but definite life to mountains.

Time was essential to Darwin’s conception of transmutation, as it had been to the geological theory of his intellectual hero Charles Lyell, who’s *Principles of Geology* (1830–33) voyaged with Darwin on the *Beagle*. Lyell argued in typically majestic prose that the power of “beholding, at one glance, the effects of causes which may have happened at intervals of time incalculably remote” had led to the so-called catastrophists to the erroneous conclusion that the geological world was shaped by events of short-lived but very great violence. But if the earth was as Lyell argued, “entirely altered” by “slow and insensible modifications” over “vast” intervals of time”, then “one or more races of organic beings may have passed away, and yet have left behind, in the particular region under contemplation, no trace of their existence” (Lyell 1997, 97). To a mind “unconscious of these intermediate links in the chain of events, the passage from one state of things to another must appear so violent, that the idea of revolutions in the system inevitably suggests itself” (97). In Lyell’s gradualistic geology, the operation of Creative Intelligence through this process of “ceaseless changes” eventually lifted the bed of the ocean “up to the height of some of the loftiest mountains” (58).

Time was so deep that Lyell even doubted that evidence of the beginning or the end of “so vast a scheme lies within the reach of our philosophical enquiries” (438).

Darwin was deeply immersed in geology and avidly read Lyell. Such thoughts were never far from his own mind as the young naturalist contemplated, with awe, the scenery of the Andes, describing in his journal their “bright colors, chiefly red & purple … utterly bare & steep hills;—… great & continuous wall-like dykes;—the manifest stratification, which where nearly vertical causes the wildest and most picturesque group of peaks” (*Beagle Diary*, March 20 1835, p. 307). Darwin had felt deeply the insignificance of men in such wild, high places. In Tierra del Fuego, he struggled to pursue the path of a mountain torrent through “cascades & dead trees”; the “gloomy depth of the ravine well accorded
with the universal signs of violence.—in every direction were irregular masses of rock & uptorn trees, others decayed & others ready to fall”. This was “savage Magnificence” (125), a landscape of “monotomous (sic) sombre appearance”. In the “still solitude,” Darwin wrote, “death instead of life is the predominant spirit” (December 19, 1832, p. 125–26). It delighted him nonetheless.

In these glimpses from his Beagle diaries, we can already discern embryonic ideas that would be so necessary to Darwin’s formulation of evolutionary change: mountains and the vast ocean of time; geological power and indifference; death and struggle; and human endeavor standing in insignificant relation to the remorseless, magnificent, stratifying, lawful but ferocious grandeur of the cosmos. A crucial characteristic of Darwin’s philosophical and investigative method, seen from his Beagle diaries on, is the way it shifts readily between the enormous, and the minute—at both of these extremes he found nature’s laws unfolding according on a scale that was not human. Looking closely at Darwin’s writing, as it takes us from the summits of the mountains being forged over time or the sediments of oceans, from seeds dispersed by bird flight to slave-making ants, we can see, as Beer (2009) has noted, an intimate, personal method of natural philosophy. How intimate and personal is shown very beautifully in Darwin’s own account of the habits of earthworms, written late in his life, in which he describes the painstaking and eccentric mode of experimentation which was indispensable to his way of solving large and small kinds of intellectual puzzles.

In worms the sense of smell apparently is confined to the perception of certain odours, and is feeble. They were quite indifferent to my breath, as long as I breathed on them very gently. This was tried, because it appeared possible that they might thus be warned of the approach of an enemy. They exhibited the same indifference to my breath whilst I chewed some tobacco, and while a pellet of cotton-wool with a few drops of millefleurs perfume or of acetic acid was kept in my mouth. (Darwin [1882] 1883, 29–30)
One worm, kept in a pot on Emma Darwin’s piano, “dashed into its burrow ... when C in the treble clef was struck” (27). And yet, the book is equally concerned with the place of worms in the operation and unfolding of history—once again, Darwin encompasses the minute and the vast. But as Beer’s study emphasises, when Darwin’s ideas are often now expressed as game-theory or in logarithms, this aspect of Darwin, his poesis—an essential part, I believe, to fully apprehending his ideas—is only rarely brought to the foreground.

Darwin came much closer in detail and in fact to the guts of animal presence than many of the thinkers of his time who are closely associated with his name or who drew on his theories. His work is rich with creatures of bilious temper, or the tendency to sting or bite. In interesting ways, that text—so present in Darwin’s writing—is strikingly absent in the works of some thinkers prominently associated with Darwin in the nineteenth century. While Huxley’s work echoes deeply the same note of time, giving it a melancholy inflection, he shows relatively little interest in the minute biological details that came to obsess Darwin as he wrote about the expression and the natural history of emotions in living animals. Spencer is another whose biological theories are frequently coupled with Darwin’s name. Yet there is a wearying remoteness to Herbert Spencer’s synthetic philosophy. Spencer relentlessly draws attention to man’s naturalistic origins. But the chief quality of his writing is its bloodless and alienating theoreticalness—he pontificates at one remove from the physical world he is philosophising about. Meanwhile Engels, seeing in Darwin’s theory of evolution the means to dispatch idealist philosophy and “vulgar” materialism alike, linked it to a tale of technology and machines, in which nonhuman animals have no history, agency, nor any biological presence—except insofar as they are related to human ends.

2.5 The instance of arrogance

Darwin understood that his account of speciation would unleash more than an ordinary kind of controversy among philosophers. Some later readers of the
Origin have suggested that the book was misnamed in that Darwin did not really positively address the origin of species at all (Mayr 1942), but David N. Reznik’s convincing reply is that the main point Darwin makes about the origin of species is a negative one: species were not products of special creation (Reznik 2010). Winning that argument would not be just a matter of pointing to objective facts, or supplying a defensible theory of how evolutionary change could be effected. It required not only overcoming abstract and metaphysical objections but ontological revulsion—something far deeper, and much harder, to resist.

How could Darwin not have known it? In 1839, in his E notebook, he had viscerally speculated that “… the parent of all vertebrate animals—must have been like some molluscous <<bisexual>> animal with a vertebra only & no head—!!” (E89, 420). The effusive exclamation marks (the notebooks are dotted with them) make plain that Darwin well understood how such a claim was likely to be received. It might be one thing to speculate that changes in the form, temperament or incidental characters of breeds wrought by the practical needs or aesthetic whims of breeders or fanciers could be analogous to a similar process in nature. It was quite another to propose that no species had an essence, and that a mere regular process of nature had yielded by chance bees and birds; horses and medusae—but above all, men and minds, through ages of slow branching from distant ancestors, extant and extinct. This would surely open up a yawning abyss to anyone who would care to step to its edge and gaze down at the fossil forms punctuating the strata but eventually fading into shadow, obscurity and finally, darkness.

“A man must for years examine for himself great piles of superimposed strata, and watch the sea at work grinding down old rocks and making fresh sediment, before he can hope to comprehend anything of the lapse of time, the monuments of which we see around us,” Darwin wrote in the Origin (1959, 282). Impressing upon his reader the magnitude of what was to be reconciled with human

9 Speculating incorrectly from the Okenite transcendental theory of the vertebrate skull that would later be overthrown, most famously, by Huxley.
experience, “What an infinite number of generations, which the mind cannot grasp, must have succeeded each other in the long roll of years!” (287).

Beer (2009, 45) says Darwin “found the constant placing of man at the centre of explanation probably the most exasperating characteristic of providential and natural theological writing”. In his D notebook, he wrote:

Mayo (.Philosop of Living) quote Whewell as profound. because he says length of days adapted to the duration of sleep of man!!! whole universe so adapted!!! & not man to Planets.—instance of arrogance!! (D49, 347)

Those exclamation marks again.

Few, particularly in Darwin’s own time, would go so far as he did in exposing the dubious foundations on which such human “arrogance” was built—even as he could yet write of men (surely with at least some irony) as the glory of the cosmos. Darwin, pondering what kind of agent we might be, actually kept the human question at the centre of his thoughts. From a close analysis of his notebooks, we can see that from the earliest period in which we have evidence of him developing his account of evolutionary common ancestry, Darwin perceived that its challenge to the metaphysical, ontological and epistemological beliefs of his time was thoroughgoing and profound. Though he did not overtly develop this thought in the Origin, it was nonetheless abundantly clear to readers like Carpenter that he had sailed perilously close to reducing the functions of a creator to that of a ‘mere’ physical agency. For Carpenter, as for the American reviewer Lowell, this was a matter for regret. For Huxley, Darwin’s work opened up the thrilling possibility of banishing creative agency altogether. How far he would go down this path in pursuit of natural man is the subject of the next chapter.
CHAPTER 3. “GIVING PLACE TO DARKNESS”: T.H. HUXLEY

If man has come into existence by the same process of evolution as other animals; if his history, hitherto, is that of a gradual progress to a higher thought and a larger power over things; if that history is essentially natural; the frontiers of the new world, within which each scientific method is supreme, will receive such a remarkable extension as to leave little but cloudland for its rival.

HUXLEY
Past and Present

A true philosopher does not blush, like Pliny, at our miserable origin.

JULIEN OFFRAY DE LA METTRIE
L’Homme Machine

Vice and virtue ... are not qualities in objects, but perceptions in the mind: And this discovery in morals ... is to be regarded as a considerable advancement of the speculative sciences.

DAVID HUME
A Treatise of Human Nature

3.1 Huxley, past and present

In June 1849, floating on a tropical sea off Australia’s north coast, Huxley—then a reluctant ship’s surgeon in his twenty-fifth year—looked down into the shadowy deeps below the HMS Rattlesnake, and recorded the thoughts that unfolded in his diary.

The little waves plish-plash ... and the light-sparkles dance and glimmer away for a brief moment and then are no more seen ... That great sea is Time and the little waves are the changes and chances of life. The ship’s side is Trouble, and it is only meeting with this that the little creatures in the water shine and grow bright. They are men. If it were calm they would not be bright. See, there is a big one; he shines like a fiery globe. He is some great conqueror. He
keeps on shining for a full minute—that is Fame—and then gives place to darkness like the rest (Rattlesnake Diary, June 2, 1849; ed. J. Huxley 1835, p. 174–5).

Two days later, the Rattlesnake sailed into “unknown seas ... a vision of reefs and wrecks” haunting the ship’s crew and its captain, that gloomy and exhausted veteran of the British navy, Owen Stanley. “As for me,” young Huxley shrugged, “‘cantabit vacuus’—it’s no business of mine” (June 4, 1849, p. 175).

We are familiar with a certain received image of Huxley as the quintessential representative of a crusading, bishop-baiting late Victorian “dogmatic science” (Turner 1974, 3). The aim of this crusade, according to this perspective, was ultimately to rout the old guard of Christian lay scientists, Tory dilettantes and religious apologists, and instantiate a new intellectual and cultural leadership for the Victorian age, liberal unbelievers in the garb of the professional man of science. In Turner’s sociological account, science in Britain was transformed during the second half of the nineteenth century by ambitious young champions like Huxley, and emerged towards the close of that century having most of the characteristics associated with a scientific community (Turner 1974). Desmond and Moore’s Darwin (1992) and Desmond’s two-volume Huxley (1994 and 1997) even more explicitly situated Huxley as an active author of this new science, riding “the political and religious crest to power” (Desmond 1997, 236). This Huxley rises from the mean streets, grimy with coal dust, bloodstained from the rhetorical fray, and armed with a dissecting blade every bit as keen as his instinct. Desmond, pressing the point home with typical flourish, has him powered by a head of steam, his “safety valves” blowing in his mechanically tooth-grinding sleep—a relentless and ambitious creature of industrial modernity (1997, 117).

For both Desmond and Turner, it was necessary to ground Huxley, the historical figure, in the social and political story of the emergence of late nineteenth-century scientific naturalism—the strategy was an explicit antidote to an older genre of Huxley scholarship with its “ahistorical and hagiographical air”
Concerned to avoid the disreputable taint of Whig history, or free-floating psychoanalytic speculation, more recent scholarship has tended even further to emphasise Huxley’s career from the perspective of science as a social process (e.g. White 2003).

While these are important contributions, I also see value in the pursuit of perhaps less process-oriented and more intuitive methodological approaches. By insisting on privileging the social process, we might be tempted to overlook revealing subtleties, internal conflicts and dramas that unfold within historical documents themselves. I argue these are entry points that are also indispensable if we are to be effective readers of ancestral texts. Michael Ghiselin baldly wrote that in the history of science, what ultimately matters is “ideas not the language in which they are expressed” (Ghiselin 1969, 240). While “the consideration of language may constitute a valuable source of insight” (241), he thinks that not all kinds of linguistic argument are substantive. But just as ideas don’t float free of their historical context, nor do words. The history of Darwin in the world is, perhaps more than any other comparably significant scientist, one that emerges from readings and (re)writings—and not just simple readings of scientific ideas. “Doing history” in this context must therefore at some point entail what is, at least on some level, a sympathetic entering into the texts—particularly if we are not to fall for simply reading the present as nothing more than a sum of social forces (or impose anachronistic interpretations upon it). The causal chain of historical contingency, after all, also links to the idiosyncratic historical individual: we must be sensitive to his or her fears, desires, and beliefs, even if, at an historical distance, we cannot authentically experience their full cultural force. As Theodore Porter has perceptively summed up this challenge, “Who can believe now in the civilizing mission of science that was for naturalists like Huxley … so vital?” (2014, 283). We don’t need to believe it ourselves, but it needs to be understandable to us why a Thomas Huxley did.

My starting point is Huxley’s concept of science as a “civilising mission”. In my view, this shaped both his interpretation of, and his response to, Darwin’s
evolutionary thought, his understanding of the role and nature of scientific knowledge, and the distinctive humanism with which he inflected both. It is also significant for his famous discussion of ethics, to which I turn in detail later in this chapter. My entry point to this perspective is in part a poetic one, which identifies recurrent themes, forms of argument, and literary devices in Huxley’s own texts which help illuminate his deep sense of the moral function of science, and his claims about the kinds of knowledge he believed it did, and those that it could not, generate. Huxley’s commitment to the scientific mission was certainly felt and expressed with all the zeal a clergyman might have felt about his spiritual vocation, and indeed, he often borrowed from their styles of argument. Much has been made of this connection, at least in relation to Huxley’s agnosticism, but in some ways, the observation comes rather too easily and conceals much more than it reveals. In short, I argue that science was for Huxley as much as anything a sensibility (in the several senses of that term)—which in itself can seem strange, in our brusque and unsentimental age, since it has become unfashionable (perhaps unfathomable), to talk about science in such terms. In any case, Huxley’s ideas cannot be decoupled as easily from “the language in which they are expressed” as Ghiselin’s reductive judgement may suggest.

I intend this form of analysis as a counterpoint to, rather than a rejection of, a correction of, or a self-sufficient alternative to, the strategies of scholarship mentioned above—which have been indispensable to me. Here, I consider Huxley’s Darwinism—more accurately, his response to the great philosophical themes opened up by Darwin’s theory of human origins—via themes that emerge in his philosophical writings and letters. There is a characteristic poetic in much of Huxley’s writing, which returns frequently to vast and sweeping themes, suffused at times with an elegiac quality. Huxley is obsessed with the ceaseless operation of impersonal natural laws, with human significance and cosmic scale, and with what he himself termed the “unknown”—the nature of Nature itself—

10 I am using the term here not only in its broader sense, inflecting it with an emotional sweep, but am mindful too of its origins in 18th century empiricism, i.e., its association with the study of sense perception, and its Victorian link to the notion of moral philosophy.
which, he insisted, must always be ultimately impervious to human efforts to
fully perceive it. This is itself an idea that can seem unfamiliar to us, but which
had a very specific place in late-nineteenth-century agnosticism (Flint 1903,
Lightman 1987). Huxley saw the practical world of human affairs (the level at
which empirical science and human ethics operated) as unfolding on a level of
subjective and empirical experience on which the ceaseless and inhuman world
of natural physical laws had no moral bearing. The beginning or end of these
vaster “cosmic” laws could not ultimately be discerned, nor would the nature of
the cosmos be revealed by scientific knowledge (Huxley [1893a] 2009a).
However, this separation was a methodological orientation, based on a claim
about the limits of natural knowledge, not a dualistic view. Kings and
philosophers, flowers and fossils, mountains and molehills—all gave way in the
end to the overwhelming forces of nature. I will argue in what follows that
Huxley’s vision of men as vulnerable but hopeful creatures on a vast and dark sea,
flaring briefly but triumphantly before giving “place to darkness”, is an apt
metaphor for his view of the heroic relationship between the “man of science”
and the natural laws which he strove to discern, insofar as “men” were able.

This orientation and sensibility shaped his by no means straightforward adoption
Darwin’s account of evolution, as much as any professional desire to unseat the
pretenders of the clergy had. It was inseparable from that desire. Scientific
knowledge, on this reading, was the embodiment of that brief but glorious
moment of heroism for which the young ship’s surgeon had yearned in 1849. It
was by what would term the “light of science” (Huxley 1890d) that the individual
could even dimly set out a path for those to follow, even as the knowledge-seeker,
trudging stoically ahead, was already swallowed by future darkness. Science could
no more prevent this personal end than it could halt planets in their orbit or
reverse the tides, but it could provide some—the only—means, during our brief
time on earth, to perceive that we were wandering in the dark at all.
3.2 Dogs and dogmas

I want to start my exploration by critically examining two elements of a powerful popular historical picture of Huxley. They are not unrelated. The first is frequently expressed in an appellation that styles Huxley as a kind of animal, or more specifically, as “Darwin's bulldog”. To give an idea of the pervasiveness of this honorific, there are over 27,000 results returned for a Google search of the term “Darwin's bulldog Huxley”. The second part of the picture is a frequently made claim that Huxley was a supposed champion of materialism. For Oren Harman (in an otherwise excellent and penetrating history of biological theories of altruism and the work of George Price), “resistance to the logic of materialism and evolution seemed to [Huxley] nothing short of the workings of Satan” (Harman 2011, 14). John Gray describes Huxley as “‘Darwin’s bulldog’ and a fervent materialist” (Gray 2011, 8). William Kimler, writing about the theorist of animal behaviour and comparative psychology Conwy Lloyd Morgan—a one-time student of Huxley's—also refers to Huxley's supposed “ardent materialism” (Kimler 2000, 854).

The textual evidence clearly supports a link between Huxley's primary philosophical commitment—his insistence that there were limits on human knowledge—and his commitment to promoting a Darwinian view of evolutionary common ancestry. It is important and germane to what follows to recognise in saying so that it was the human story, rather than the natural history of animals, that really fired Huxley's scientific mission. The impersonal entity that Huxley called the “cosmos” has a real presence in his writings, exerting an imperious power over humankind. But Huxley was not a naturalist of the Darwinian style. Animals never quite appear in Huxley's writings the way that they do in Darwin's. Darwin had the field naturalist's eye and sympathetic ear for the “entangled bank” of living things, as he poetically wrote in the Origin (Darwin 1859, 489). Darwin's animals were rich in endowments. They were emotional, each expressive with the form and energy peculiar to its natural kind. Darwin's
animals move, breathe, smell, raise their hackles, and respond viscerally to stimuli. They copulate, bite, pounce, build artifacts, and enslave each other. They yawn and squeal. He describes elephants as capable of understanding loss, and dogs as feeling a sense of shame (Darwin 2004). His relationship to animals, such as his family dogs (Townshend 2009), ‘Jenny’ the infant orangutan at London Zoo (Van Whye and Kjaergaard 2015), and even his experimental worms, was frequently up close and personal. But Huxley’s animals never quite seem real or whole. When animals appear in Huxley’s essays, they very often serve as illustrative or instructive points, or have literary or metaphorical functions. Huxley’s animals and living forms appear in a range of ways: as conscious automata (Huxley 1874), as fossils, skeletons and embryos (Huxley 1863a and 1863b), as “architectural” types (Huxley 1853), as philosophical or rhetorical foils (Huxley 1888 and 1890b), or as structural models for the proper teaching of the zoological method (Huxley 1861). Huxley’s animals are, in other words, employed in the service of a very human-centred philosophy of nature.

If we were to assign Huxley an emblematic animal, it would not be a monkey. This is despite the legend of the “hippocampus minor” debate (in which Huxley demonstrated that there was no structural cerebral barrier setting men apart from apes). It is also despite the 1860 Oxford “evolution debate” at the British Association for the Advancement of Science. In this set piece in the dramatic history of Darwinian evolution, Huxley is traditionally portrayed as carrying the day for Darwin’s theory (and polishing off Darwin’s godly rival, the transmutation-denying Bishop Wilberforce) by coolly announcing that he (Huxley) would prefer to be descended from an honest ape than to share kinship with an intellectually meretricious and disingenuous theologian. (That “story” has been many times told, and the finer details of it questioned, so need not be gone over here—for accounts, see Desmond 1994 and Hesketh 2009). As it would turn out, however, Huxley’s emblem in posterity is a dog: not just anyone’s dog, but Darwin’s. “Darwin’s bulldog” is a familiar term, so often appearing

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11 A brief account of this is given in chapter 4.
beside Huxley’s name as to seem synonymous with it. The relevant search results returned for “Darwin’s bulldog Huxley” span scholarly and popular science literature, personal and institutional blogs, museums, universities, archives, creationist and anti-evolution sites, and generalist histories of science. In the printed archive, Darwin’s “bulldog” appears in sources as diverse as Himmelfarb 1959, Mayr 1982, Kinna 1992, Stack 2001, White 2003, Gray 2011, and de Waal 2006 (to name but a few authors who casually employ this phrase). Encyclopaedia Britannica’s online site directs the term “Darwin’s bulldog” straight to its entry on Huxley. Most scholarly authors explicitly paint a more nuanced picture of Huxley than is suggested by this term, yet seem to find it necessary to at least acknowledge the popular ascription (e.g. Lightman 1987). Michael Ruse goes further and acquiesces, opening his contribution to a collection of centenary essays on Huxley with the bold declaration that Huxley is “rightly” remembered as Darwin’s bulldog (Ruse 1997, 140). Ruse sets this against what he sees as a paradox, which is that despite Huxley’s alleged bulldoggery, Darwinian evolution featured very little in Huxley’s professional life as an active scientist and teacher—in part because according to Ruse, for Huxley, “evolution was always something much closer to secular religion than it was to professional science” (149). Ruse, in this essay, glibly sets up Huxley’s view of evolution within a framework centred on the split between science and religion, which takes the tendency to both as coming from the same psychological urge. If Huxley hadn’t been “Darwin’s bulldog”, Ruse declares, he would have been, in another age, “the Archbishop of Canterbury or the Pope”—because he “needed a faith, a doctrine, a metaphysic” (155). I will argue that the notion of Huxley’s attachment to evolution as a “secular religion” (155) is a common but inadequate sketch, obscuring the significance of Huxley’s epistemological scepticism.

“Darwin’s bulldog” has come to stand in for Huxley’s perceived role as a kind of clergy-taunting megaphone for the triumph of Darwin’s theory of evolution—a rhetorical contribution characterised across the web with similar terms: agitprop,
It was, very possibly, originally Huxley’s own term. According to the paleontologist Henry Fairfield Osborn (who would later be a president of the American Museum of Natural History), Huxley had remarked to him in 1879, “You know, I have to take care of [Darwin]. I have always been Darwin’s bull dog.” The phrase is suggestive, conjuring as it does a pugnacious, gruff tenacity, and winning loyalty. It also rather fails to disguise the evident political strategy behind the remark: Huxley is clearly positioning himself as the great evolutionist’s *sine qua non*.

Whether Huxley intended it to be so or not, as a piece of personal branding, it is something of a minor masterpiece, surviving the man, his agnostic philosophy, and his age. But this over-used sobriquet has become a myth. In the broad historical archive, Huxley’s own philosophical views, and their relationship to his by no means unconditional scientific assessment of Darwin’s ideas (Huxley 1863a and 1863b, 1878, and 1893b), become subservient to his part in a narrative of Darwinian evolution’s supposedly inevitable march to triumph.

I have spent some time pressing this point because I am interested in how Huxley responded to, and drew on, Darwin’s work, as an intellectual and philosopher in his own right. Some of the important and significant philosophical themes in Huxley’s work include epistemic doubt, transience, suffering, and death—and, touching as it did on all of these themes, Darwin’s theory of common ancestry supplied scientific and rhetorical authority, but also a rich poetic imaginary, for Huxley to draw on. Bernard Lightman, in his perceptive study of Victorian agnosticism (Lightman 1987), remarks how easily our twentieth century worldview—“molded by the rise of evolutionary theory, the development of agnosticism, and the pervasiveness of empiricism” (3)—obscures some of the fundamental precepts of agnostic thought, in particular, the ambivalence of Victorian agnostics like Huxley toward certain forms of knowledge claims.

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12 This is also the manner in which Huxley is portrayed in Jon Amiel’s 2009 film *Creation*, an account of the writing of the *Origin*.

13 It is hard to be certain, but the editors of the Huxley Files suggest this as the possible source for the term, see http://aleph0.clarku.edu/huxley/guide4.html
I would add to this that our contemporary view of scientific naturalism—inflected by the rapid scientific and social evolution of Darwinian thought throughout the twentieth century—also naturalises evolutionary ideas as Darwinian evolutionary ideas. We find it hard to imagine ourselves into the historical mindset of others who entertained, rejected or presaged transformist ideas: a Richard Owen or a Georges Cuvier, a La Mettrie, a Buffon or a Geoffroy. Such figures often become simply transitional figures in what is ultimately Darwinian history—and this masks the many assumptions we bring about that history to our interpretation of the past. This is a problem that the Darwin historian Peter Bowler has recently tackled with a counter-factual historical exercise (Bowler 2013) in which we are invited to imagine developments in biological science had Darwin been whooshed into historical oblivion by a freak wave overcoming the Beagle.

I therefore pursue a different Huxley to the well-rehearsed bulldog, secular pope, or scientific pugilist. Darwin certainly captured Huxley's scientific imagination (a story with which we are familiar), but he just as importantly captured Huxley's poetic, rhetorical and epistemological imagination too. What Huxley found compelling in Darwin's theory of origins can be gleaned in the instincts of that 1849 entry in his Rattlesnake diary, where the young man peered into the dark sea, and contemplated eternity with a wistful, lonely sense of heroism. This was before Huxley's own career was of any significance, or in any way entangled with that of the man who would become the great Victorian evolutionary theorist. For Huxley, the scientific cause was always to do with “man's place in nature”—which was, of course, the title he gave to his canonical book in defence of evolutionary common ancestry (Huxley 1863a). But Man's Place said little about that quintessential Origin concern of speciation.

Like his other writings, Man’s Place suggests that Huxley found in Darwin’s account of evolution a science steeped in deep time that emphasised nature as directing all by an eternal, but law-bound, process of physical change. Setting
aside Darwin’s views on natural selection—which were to be treated with judicious reservation, Huxley wrote:

> in view of the [intimate structural] relations between Man and the rest of the living world ... I can see no excuse for doubting that all are coordinated terms of Nature’s great progression, from the formless to the formed—from the organic to the inorganic—from blind force to conscious intellect and will. (Huxley [1863a] 2001, 111)

Given this fundamentally purposeless nature, Huxley could not discern any metaphysical purpose for the brief candle of human existence. This was no dualistic position, but a profound naturalism that recognised that human life was incommensurably out of scale with nature’s great cardinal forces (the true nature of which lay, for Huxley, beyond the reach of empirical verification). If there is any sense in which Huxley can be meaningfully said to have treated evolutionary theory as a “secular religion”, as Ruse claims, it is on my reading a very restricted sense, one that rests largely on the strength of feeling and the imaginative power of his poesis. It can be summed up by a suggestively eloquent phrase of Bernard Lightman’s, who writes that Huxley and other leading Victorian exponents of agnosticism had in common that they recognised that “the source of religious feeling was largely the sense of awe produced by contact with nature” (Lightman 1987, 144). Like the theologians with whom agnostics like Herbert Spencer, Leslie Stephen, John Tyndall, William Clifford and Huxley fought rhetorically charged late-nineteenth-century battles for the future of science and philosophy, they attempted to embody this emotion and sensibility in the “language of the intellect” (144).

One of the things that we can therefore lose sight of by focusing on the professionalising, externalist account of the ambitious “man of science” is this literary Huxley. For Huxley, it was not pigeon breeding, but Darwin’s branching schema of common descent—its lines leading backwards and finally into the dim obscurity of the past—traced in the rocky layers of cliff-faces and weathered rock,
that was at the heart of the evolutionary sensibility. In ‘Past and Present’ (1894), Huxley would call paleontology “the most important” branch of science when it came to determining the evidence for accepting evolution (Huxley 1894a, 3).

3.3 The ‘x’ club: Huxley and materialism

A term that often crops up alongside Huxley’s name is “materialist”. Even some otherwise historically sensitive and subtle scholars, like Harman and Kimler, have described Huxley as a materialist without further qualification or discussion of their use of this term. It is worth delving deeper to some assumptions that may lay behind this claim, given Huxley’s often-repeated and explicit refusal to identify his views with the materialist ‘creed’. Huxley also responded vigorously to anyone who did charge him with being a materialist, going so far as to reject materialism as a “philosophical error” (Huxley [1886] 1892, 170), and calling it a position “untenable and destined to extinction” (164). Indeed Lightman (1987), following Flint (1903), has pointed out that the term agnosticism was used by Huxley in part to explicitly distinguish his view from atheism and theism, but also, from systematic positivism, empiricism and materialism. In Huxley’s own words, most people who adhered to these isms were agreed on “the one thing in which I differed from them. They were quite sure they had attained a certain ‘gnosis’—had, more or less successfully, solved the problem of existence; while I was quite sure I had not, and had a pretty strong conviction the problem was insoluble” (quoted in Flint 1903, p. 2). Agnosticism was not a creed, “but a method” (Huxley [1889] 1892, 281). Moreover, and which I will come to presently, the materialism that Huxley took aim at was historically particular—and quite different to the modern way the term is often understood.

Huxley certainly made statements, particularly in his essay ‘On the Physical Basis of Life’ (1868) that surely hinted he had at least some broad sympathies with the materialist view. But he denied these extended to a thoroughgoing metaphysical materialism (Huxley 1868 and 1886; Paradis 1978; Lightman 1987; Desmond 1997; Greenwood 2010). Mandelbaum (1971, pp. 20–28) gives a subtle account of the
different species of nineteenth-century materialist thought, pointing out that
materialism at the bottom is really a metaphysical claim that seeks to state what
ultimately constitutes reality. As we shall see, this was, for Huxley (and other
agnostics), precisely the issue on which he parted company with the materialists’
creed—they made “positive assertions about matters of which I am certain I
know nothing” (Huxley [1886] 1892, 171). It might be tempting, particularly for a
modern reader, to suspect that the canny and ambitious Huxley had political or
practical motivations for not wanting to taint himself by association with the
materialist mantle. Engels, for one—raising the flag for his own distinct
dialectical materialism—dismissed the agnostic position as simply shamefaced
materialism (Engels [1892] MECW Vol. 24). And it is true that in the nineteenth
century, to insinuate that one’s philosophical opponent was a materialist was a
potentially convenient strategy that could be employed to shift debate to the
terrain of moral authority (as W.S. Lilly did in an 1886 article directed against
Huxley, published in the *Fortnightly Review*). Huxley’s point of departure was,
however, a philosophical claim, rather than a pragmatic denial of an
inconvenient truth.

Huxley was consistent in his rejection of materialism both publicly and privately.
In 1863, for example, he wrote to the social reformer, Anglican cleric and novelist
Charles Kingsley 14—with whom he shared a philosophically frank and searching
personal correspondence—that materialism and spiritualism were “opposite
poles of the same absurdity” of “imagining that we know anything about either
spirit or matter” (Huxley to Charles Kingsley, May 22 1863, *Life and Letters Vol. I*,
p. 243). Huxley went on to admit that he could at least work best with the
fundamental ontological hypothesis of “Materialism or Pantheism, according as
you turn it heads or tails”—because this, at least, posited that the natural world
consisted of “only one $x$”, which “chimes in better with the rules of the game of
nature” (244). As to theological explanations, however: “the $x$ of science and the $x$

of genesis are two different x’s and for any sake don’t let us confuse them together” (244).

Huxley stated the same position somewhat differently in 1870, in an essay on Descartes’s *Discourse on Method*. Huxley argued that the *Discourse* logically opened up two possible paths for subsequent philosophers to follow, one leading “by way of Berkeley and Hume, to Kant and Idealism”, and the other, via La Mettrie and Priestley, to modern physiology and materialism (Huxley [1870] 2005, 190). With the materialists, Huxley accepted that “the human body, like all living bodies, is a machine”, amenable to explanation on physical principles (191). But he carefully added the caveat that it should be admitted as “a matter of experimental fact” that the human body was “a machine capable of adjusting itself within certain limits” (192), my emphasis. This caveat was crucial to his point, and in fact, as I will argue, the foundation his theory of ethics—it gave Huxley a definite, but narrow, window via which to escape a total determinism, as we shall come to in the next section.

Huxley refused to make the slide from the belief that man is effectively a product of mechanically unfolding laws to a wholesale materialism such as that advocated by materialists like the German Ludwig Büchner, who held “nothing else in the universe but Matter and Force and Necessary Laws” (Huxley [1870] 2005, 193; Büchner 1864). Mandelbaum notes that in its strictest and most reductionist form, the materialist position in the nineteenth century would claim that ultimately, all the physical properties revealed by or inhering in material objects can be explained in or reduced to, “identical sets of terms, regardless of their disparities” (Mandelbaum 1971, 22). This is itself a metaphysical claim, opposed to both idealism and to positivism, seeking to make a definite and unifying statement about what ultimately constitutes reality. By this definition, Mandelbaum argues that there were relatively few strict materialists in the nineteenth century, and Huxley did not count himself among them. To assert this strict materialist position, Huxley thought, was surely for the philosopher to “stray beyond the borders of their path” ([1870] 2005, 193).
This idea of necessary laws that “always will hold good” and to which no contrary can be conceived, was, for Huxley (here influenced as always by Hume) a grave error of scientific and philosophical method. For what, Huxley wondered, were “‘Matter’ and ‘Force’” other than “mere names for certain forms of consciousness”? The material world could only be known to us mediated by the human senses: “If I say that impenetrability is a property of matter, all that I can really mean is that the consciousness I call extension, and the consciousness I call resistance, constantly accompany one another” (193–4).

Huxley recommended to “both metaphysical and physical thinkers” Descartes’s instruction to accept “no proposition the matter of which is not so clear and distinct that it cannot be doubted” (194). He admonished the materialists to admit that all knowledge of the physical world was mediated by sensory experience, and our consciousness of it. The limits on our epistemological access to the world, Huxley thought, should in turn place proper limits on the extravagance of philosophical claims about what “it”—the cosmic x—was made up of.

We have inherited a narrow historical view of agnosticism as being fundamentally concerned with opposing religious claims (Lightman 1987). Following this line, when Huxley is described in contemporary commentary as a “materialist”, I interpret this term as being collapsed into a more general claim about his commitment to scientific naturalism. What is interpreted as a dogmatic materialism is, in fact, Huxley’s insistence that metaphysical, supernatural or theological speculation should be strictly separated from the method and activity of science, and from what is allowed to count as “natural knowledge”. This is something about which Huxley was certainly dogmatic. However, this is a claim about method—not a metaphysical commitment to stating what reality ultimately is.
Frederick Gregory (1977a) points out that scientific materialism is often understood among modern philosophers as synonymous with physicalism. This modern use of “materialist” in relation to Huxley is actually an anachronistic intrusion into the frame of reading. It seems to assume there is a broad consensus that science does not admit any form of theism (except insofar as religious feeling is a natural phenomenon inviting scientific investigation), or—the stronger assertion—that all or most practising scientists accept the view that everything supervenes on the physical. But as Matthew Stanley points out, the “existential connection of naturalism with science is a relatively recent development” (Stanley 2014, 7) Moreover, writes Stanley, a distinction can be made between methodological naturalism—“science should be done without reference to or consideration of the supernatural or the divine” (8, author’s italics)—and metaphysical or ontological naturalism, the much stronger claim that no supernatural or divine forces exist (see also Ruse 2005). Stanley points out that the metaphysical/methodological distinction was philosophically live for scientific naturalists of the nineteenth century.

To describe Huxley as a “materialist” without further elaboration implies that he had a conviction and certainty about the status of our knowledge of the natural world, and that humans are capable, in principle at least, of describing it completely. In fact, this was precisely the kind of knowledge Huxley doubted was possible. The term agnosticism was “a confession of ignorance—a warning set up against philosophical and theological phantasms … never more needed than at the present time when the ghost of the ‘Absolute’ slain by my masters Hume and Hamilton is making its appearance in broad daylight” (Imperial College Huxley Papers 30: 152–53, quoted in Lightman 1987 p. 13). Huxley severely criticised the positivism of Comte, who held that human thought and social organisation were continuous with the natural world, such that our knowledge of that world developed through a law of three stages: theological, metaphysical and finally, positive (or scientific) knowledge. Huxley scathingly dismissed this as melding “dogmatism and narrowness” with a Catholic spirit of “meddling systematization and regulation” (Huxley 1869, 147), and reasoning from the abstract and a priori.
Excoriating Comte for arguing that the study of living organisms in the particular first required reference to more general principles or laws of life, Huxley retorted: “If M. Comte had possessed the slightest practical acquaintance with biological science, he would have ... perceived that we can have no knowledge of the general laws of life, except that which is based upon the study of particular living beings” (146). It was Hume’s empiricism, not Comte’s positivism, which, for Huxley, was the route to the proper spirit of science.

3.4 Darwin in dark permanence

The popular myth of the ardently materialist Darwinian bulldog also tends to overshadow Huxley’s well-documented scepticism about natural selection. Huxley did not simply doubt that natural selection had empirical support. His attitude to this central tenet of Darwin’s evolutionary thought was one of indifference, and he never spent time, for example, looking into the kinds of programs in selective breeding that he thought would ultimately be needed to supply the evidence to support it, such as breeding two forms from common stock that would be unable to cross one another (Huxley 1863b).

But something about Darwinian ancestry moved him—and the answer lay in paleontology and deep time, and in Huxley’s perception that the scale of the cosmic order was incommensurate with human experience and psychology. In 1894, in a ‘Prologomena’ published with ‘Evolution and Ethics’, Huxley would write that “boundless space” had endured through “boundless time”, with plants, animals, the planets and stars each “working out their predestined courses of evolution” ([1894b] 2009b 7). Scientific knowledge intervened between that unbounded cosmic realm and the epistemically bounded world of the human senses and could push out the boundaries of the latter. Scientific knowledge was the very expression of human perspective and scale: practical, and warding off the persistent ontological challenge of eternity. Knowledge could never be absolute, but it could at least push out the borders of human ignorance.
Young Huxley had pondered time, change and impermanence, over the side of the *Rattlesnake*, long before transmutation concerned him. Years later, Darwin’s theory of evolutionary common ancestry gave to this philosophical sensibility a new and scientifically plausible form. Time appears as a kind of character in Huxley’s writings, as it had in the writing of Darwin and of Lyell. Time exerts brooding and indifferent, but very active, power in his work. Explicit in Huxley’s writing is the idea that (as Jean-Paul Sartre would evocatively put it in the mid-twentieth century) if all living things ceased to exist to observe it, the universe would simply “sink back into its dark permanence” (Sartre 2001, 28). Consider this lyrical, elegiac passage, from his famed ‘On a Piece of Chalk’ (1868)—a public lecture Huxley delivered to workers in Norwich:

> [t]here is a writing upon the wall of cliffs at Cromer, and whoso runs may read it. It tells us, with an authority which cannot be impeached, that the ancient sea-bed of the chalk sea was raised up, and remained dry land, until it was covered with forest, stocked with the great game the spoils of which have rejoiced your geologists. How long it remained in that condition cannot be said; but, ‘the whirligig of time brought its revenges’ in those days as in these. That dry land, with the bones and teeth of generations of long-lived elephants, hidden away among the gnarled roots and dry leaves of its ancient trees, sank gradually to the bottom of the icy sea, which covered it with huge masses of drift and boulder clay. Sea-beasts, such as the walrus, now restricted to the extreme north, paddled about where birds had twittered among the topmost twigs of the fir-trees. How long this state of things endured we know not, but at length it came to an end. The upheaved glacial mud hardened into the soil of modern Norfolk. Forests grew once more, the wolf and the beaver replaced the reindeer and the elephant; and at length what we call the history of England dawned (Huxley ([1868a] 1894, 27).

Here, in this world where all things are ultimately alone even while a part of a universal flow, the forces of nature moved through countless generations—outside of the possibility of history, unobserved by the human eye. It would take the human gaze and human science—most specifically, the sciences of palaeontology and geology—to conjure history from that obscurity. As with so much of Huxley’s writing, the note of melancholy sounded in ‘On A Piece of
Chalk’ contrasts with the historical image of a confident man of science forging a “normative role” for science in ascertaining truth (Turner 1974, 18). Science could indeed, for Huxley, lead to a deeper apprehension of the world. But the truth divined from the cliffs of Cromer had nothing to do with bishops or steam engines. Cromer tells that all meaning ultimately cedes to time’s ‘whirligig’. Things endure, pass away, and become something else—if by some happenstance, they become men, even so this too is a contingent, fragile and threatened state of affairs.

In 1863, Huxley had written to Kingsley that whether “astronomy and geology can or cannot be made to agree with the statements as to the matters of fact laid down in Genesis—whether the Gospels are historically true or not—are matters of comparatively small moment in the face of the impassable gulf between the anthropomorphism (however refined) of theology and the passionless impersonality of the unknown and unknowable which science shows everywhere underlying the thin veil of phenomena” (Huxley to Charles Kingsley, April 30, 1863, Life and Letters Volume I, p. 239).

3.5 Non-metaphysical molluscs

Species, as such, were hardly a topic of great interest to Huxley: “species work was always a burden to me” he remarked in his Autobiography (Huxley [1890a] 2005, 7). And when the concept did engage him, it was largely insofar as he was interested in “the architectural and engineering part of the business, the working out the wonderful unity of plan in the thousands and thousands of diverse living constructions, and the modifications of similar apparatuses to serve diverse ends” (7). So much was this Huxley’s instinct that Darwin’s views about species had not at first even been particularly intelligible to him (Huxley 1887, in F. Darwin 1887). His early conviction that species were ultimately circumscribed in their morphological possibilities by structural limits prevented him from at first understanding Darwin’s arguments for the modification of species over time (Desmond 1994).
In a chapter contributed to a *Life and Letters of Charles Darwin*, Huxley declared that throughout the 1850s, he had been “agnostic” on the question of transmutation (L. Huxley 1900b, 168). No writer, he thought, had produced sufficient evidence for, let alone a plausible cause adequate to explain, such a possibility, and he had savaged the “unscientific” (168) ignorance of Robert Chambers, who had laid out his own vision of evolution in the popular *Vestiges of the Natural History of Creation* (1844) (reviewed by Huxley, in its tenth edition[!], in 1854).

In an 1853 essay on cephalous molluscs, Huxley had attempted to isolate the “archetype” of this division of invertebrates. He was emphatic that this term was not used metaphysically, as some used it: Huxley’s archetypes were not “real or imaginary ‘ideas’ upon which animal forms are modelled” (Huxley 1853, 50).

> All that I mean [by archetype] is the conception of a form embodying the most general propositions that can be affirmed respecting the Cephalous Mollusca, standing in the same relation to them as the diagram to a geometrical theorem, and like it at once imaginary and true. (50)

Huxley tended to the conclusion that the cephalopoda and gastropoda “are morphologically one … modifications of the same archetypal molluscous form” (62). But “[this] archetypal Cephalous Mollusk … is, in all its modifications, sharply separated from other archetypes, whatever apparent resemblances or transitions may exist” (62, my italics). Quoting Cuvier’s observation that the separation between fishes and cephalopoda demonstrates a “manifest hiatus” among Nature’s productions (62), Huxley here revealed his “architectural and engineering” biases. Archetypes as such were an abstraction, of course: they were the formal possibilities distilled, so organisms were not literally striving to express a metaphysical ‘idea’. But nature did set definite limits on the extent to which forms could change.
Huxley concluded that “no anamorphism takes place in this group” (63). There was “no progression from a lower to a higher type”, but “merely a more or less complete evolution of one type” (63). However, he did conclude on a telling note. While not conceding that “true anamorphosis” ever occurs in the animal kingdom, Huxley ended his essay with the remark that if anamorphism were to occur, it would present a fatal challenge to “the doctrine that every natural group is organized after a definite archetype”. Were there to be evidence for anamorphic change, Huxley recognised that the doctrine of formal archetypes—“which seems to me as important for zoology as the theory of definite proportions for chemistry”—must be “given up” (63).

It was evidence of just this that Darwin was gathering, cloistered in Kent. Huxley sent his mollusc paper to Darwin, who penned a polite reply. It was the early days of their intellectual courtship, but Darwin was already sufficiently comfortable to remark that he too detested the concept of type as employed by “Owen, Agassiz and Co.”. They were both opposed to a metaphysical notion of type. But Darwin expressed surprise at Huxley’s rejection of anamorphism: “I should have thought,” he wrote, “that the archetype in imagination was always in some degree embryonic, & therefore capable & generally undergoing further development … I am a believer that when any part usually constant differs considerably in different allied species; that it will be found in some degree variable …” (DCP, Letter no. 1480). The mild tone masked the astuteness. He was putting ideas in Huxley’s head—even if Huxley, for now, failed to fully grasp them (Huxley 1887 in F. Darwin, Desmond 1994).

3.6 Inside the mind of a machine

Reviewing the Origin, Huxley praised Darwin’s dogged empiricism, hoping it might “carry us safely over many a chasm in our knowledge” by a path that was “not a mere airy track, fabricated of ideal cobwebs”, towards a region free from the snares of the old metaphysics, one in which “biological phaenomena” (Huxley [1859] 1893, 21) could be accounted for naturally. As for natural selection itself,
Huxley would write in 1860 if “the orbit of Darwinism” should prove “a little too circular” and “species should offer residual phaenomena, here and there, not explicable by natural selection”, that should hardly matter. The decisive blow had been struck, towards “extending the domination of Science over regions of thought into which she has, as yet, hardly penetrated” (Huxley [1860] 1893, 79).

These regions, inevitably, encompassed human mind. Investigating this topic, we will see how strikingly different the emphasis of Darwin was compared to his self-avowed bulldog. In 1872, Darwin, painstakingly elaborated his naturalistic theory of the evolution of mind, drawing on the emotional expression of human and nonhuman animals. Darwin, though, largely declined to speculate about the actual nature of that mind. He stayed away, too, from discussing in full the metaphysical implications of this work. In *The Expression of the Emotions* Darwin would be coy about terms such as “free will” (Darwin 1872) and although he gave a mechanical account of human expression, which drew for its evidence on technologies including galvanism, and on new developments in theories about the nervous system, Darwin steered clear of the sort of language that would equate either animals or humans with machines: Darwin does not present his dogs as conscious “automata”.

Huxley came at the question of animal and human minds from a rather different perspective. I will spend some time developing an account of it here, because it provides a crucial underpinning for my reading of Huxley’s view of the relationship between evolution and the ethical process. In 1874, Huxley delivered an address, published in *Nature* as ‘On the Hypothesis that Animals are Automata, and its History’. This was not a piece in the spirit of Darwin’s natural history, but in a tradition of philosophical inquiry about consciousness running back to Descartes. Descartes had argued that the behavior of animals, and some human motions and actions, could be explained only with reference to mechanistic corporeal principles. What differentiated humans from animals, according to Descartes was that humans possessed self-consciousness in the form of a rational soul. Humans were not (unlike animals) ‘automata’ whose behavior
was entirely subsumed by physiological laws. In 1747, the radical French materialist Julien Offray de La Mettrie challenged Descartes’s dualism in the anonymously-published *L’Homme Machine* (Machine Man). He argued that the Cartesian theory “spiritualised matter”, whereas Descartes should have materialised the soul (La Mettrie 1996, 3). Consciousness could be explained on material principles, and so Descartes had made an error in denying animals possessed consciousness. Rather, humans and animals alike were thinking and feeling machines. In his essay on animal automatism, Huxley drew on a picture emerging from nineteenth century science to also reject the Cartesian claim that animals were “unconscious machines” (Huxley 1874, 238). La Mettrie and Huxley, one and a quarter centuries apart, differ in their construal of consciousness and in the substance of their respective cases. However, the intent of Huxley’s engagement with this question seems clear. If science was to banish metaphysical speculation about final causes, this would require not just a plausible account of how human emotions may have evolved by incremental change (Darwin’s work), but a very explicit theory about what consciousness might really be.

In what follows, I draw on important insights from the work of John Greenwood (Greenwood 2010), but situate these within my broader analysis of Huxley’s philosophical and ethical commitments, locating the pivot of Huxley’s theory of consciousness in his agnostic position on the limits of knowledge. The account of consciousness offered by Huxley in 1874, and in other writings such as ‘Mr. Darwin’s Critics’ (1871), supports this interpretation on a number of counts. Huxley was certainly well aware of the profound theoretical difficulties that beset the pursuit of a scientific understanding of consciousness. In Lesson VIII of his *Lessons in Elementary Physiology* (1866), he had outlined the problem in this way.

> We class sensations along with emotions, and volitions, and thoughts, under the common head of states of consciousness. But what consciousness is, we know not; and how it is that anything so remarkable as a state of consciousness comes about as the result of irritating nervous tissue, is just as
unaccountable as the appearance of the Djin when Aladdin rubbed his lamp in the story, or as any other ultimate fact of nature. (Huxley 1866a, 193)

Huxley begins his 1874 discussion of animal automatism with the supposition that on the logic of the scientific evidence available, physical changes in the nervous system must be admitted to be the prior cause of any state of consciousness ([1874] 2005, 238). It is sometimes assumed that by developing this idea of consciousness arising as a product of molecular changes in the brain, Huxley undermined the possibility of mental causation in such a way that the claim amounted to the idea that conscious awareness or a ‘mental state’ must be simply the powerless byproduct of this chain of physically determined events. Huxley’s use of the term “automata” may also misleadingly push us toward this kind of a reading (Greenwood 2010), because of its association with the Cartesian term. Indeed David Chalmers (2002) ranks Huxley as a form of dualist, although not of the Cartesian sort. But we shall see whether that is a fully convincing or adequate interpretation. Huxley did certainly state that “we have as much reason for regarding the mode of motion of the nervous system as the cause of the state of consciousness, as we have for regarding any event as the cause of another” (2005, 238–9), and he found no reason to doubt that “the emotions of brutes, and such ideas as they possess, are … dependent upon molecular brain changes” (239).

Moreover, Huxley did not see that a conscious state could possibly be the cause of the molecular changes giving rise to muscular motion according to natural laws of cause and effect. In the lower animals, volition (if it existed) was an indication of physical changes—but could not be their ultimate cause. As Huxley put it, therefore, in a famous nutshell of an argument:

> The consciousness of brutes would appear to be related to the mechanism of their body simply as a collateral product of its working, and to be as completely without any power of modifying that working as the steam-whistle which accompanies the work of a locomotive engine is without influence
upon its machinery. Their volition, if they have any, is an emotion indicative of physical changes, not a cause of such changes. (240)

This is so-called “steam-whistle” representation of consciousness and of the relationship between what Huxley refers to as neurosis (the physical basis of consciousness in the processes of the nervous system) and psychosis (consciousness itself).

In the essay ‘Mr. Darwin’s Critics’—a response to criticisms leveled at Darwin by St. George Jackson Mivart, in particular—Huxley laid out some illuminating aspects of his thinking on consciousness. Here, he suggests that the critical distinction between neurosis and psychosis from the perspective of the scientist is that while the neuroses might, at least in principle, be traceable through “all their complexities” by any anatomist or and physicist, only the individual has “immediate knowledge” of, or access to, his or her psychosis (Huxley [1871] 1890, 280). As such, the neuroses are amenable to empirical investigation, but Huxley doubted whether it would ever be possible for science to crack open the mystery of subjective conscious experience or a mental state. This was a view he repeated in ‘Science and Morals’, published in the Fortnightly Review in 1886. In that essay he remarked that the subjective experience of an orangutan munching durian was surely something “as utterly outside the bounds of physics as is the ‘fine frenzy’ of a human rhapsodist” (Huxley 1886 [1892], 167–8).

Two points about this distinction as Huxley drew it seem particularly germane. The first is that Huxley does not suggest that conscious experience is not under the aegis of physical laws in the sense that its existence necessitates recourse to a metaphysical explanation, such as the possession of a soul (and Huxley in fact argued that his own position was consistent regardless of where one came down in the matter of whether animals had or did not have souls [2005, 242—3], since either case could fit with the hypothesis that consciousness is the indirect result of material changes). The second point is that Huxley did not argue that this distinction contradicted the possibility of free will, in any ordinary sense of that
term. Despite introducing the metaphor of the steam engine Huxley was willing to ascribe a kind of free will to animals (and by extension, to humans), as conscious entities. He gave this example. A greyhound might be considered “a machine impelled to the chase” (241). It was physiologically caused to have the desire to chase down its game. But, to the extent that nothing external prevented it from doing so (such as being on a leash), it could be said to be acting freely in accordance with this physiologically initiated desire.

Another apposite point about the relationship between neurological processes and mental states is made in ‘Mr. Darwin’s Critics’, which is of special relevance to his theory of ethics. In this essay, Huxley uses a human example, and argues that even in the absence of conscious awareness of the causal chain of steps leading up to any bodily action, a given action may still properly be called rational even though it might be carried out apparently without thinking about it. He explains this using the example of a gamekeeper learning his art in a way that, by practicing a learned behavior, he is soon able to carry it out as though automatically.

When the gamekeeper was first trained to his work every step in the process of neurosis was accompanied by a corresponding step in that of psychosis, or nearly so. He was conscious of seeing something, conscious of making sure it was a hare, conscious of desiring to catch it, and therefore to loose the greyhound at the right time, conscious of the acts by which he let the dog out of the leash. But with practice, though the various steps of the psychosis remain—for otherwise the impression on the retina would not result in the loosing of the dog—the great majority of the steps of the psychosis vanish, and the loosing of the dog follows unconsciously, or as we say, without thinking about it, upon the sight of the hare. No one will deny that the series of acts which originally intervened between the sensation and the letting go of the dog were, in the strictest sense, intellectual and rational operations. Do they cease to be so when the man ceases to be conscious of them? That depends upon what is the essence and what the accident of those operations, which, taken together, constitute ratiocination. (1890, 280)
The manner in which this links neurosis and psychosis shows why it is careless to represent Huxley as a dualist. It also suggests that the critical word in his famous paragraph about the ‘steam-whistle’ consciousness of “brutes” is actually “appears”. Consciousness appears unrelated to the mechanisms of action in the nervous system of a lower animals such as frog, whereas, what is in fact the case, Huxley suggests, is that it is unrelated only in the sense that volition is “superfluous” to the action, and does not enter “into the chain of causation of their action” (241). Extending the logic of this view to humans, Huxley acknowledged that it could be said to follow that on an “extreme” illustration of the implications, “the feeling we [humans] call volition is not the cause of a voluntary act, but the symbol of that state of the brain which is the cause of that act” (244). On the line of interpretation I have been following, Huxley is suggesting that there is no “problem” of a radical discontinuity between consciousness and neurosis necessitating recourse to a truly dualistic explanation or to metaphysical explanations for the former. The discontinuity between neurosis and psychosis pertains only to the lack of access to or awareness of the changes that take place in the nervous system leading up to any action, or to the experience of any mental state.

In constructing the case so, Huxley was not disposed to deny humans something that might be legitimately termed free will, writing that

we are conscious automata, endowed with free will in the only intelligible sense of that much-abused term—inasmuch as in many respects we are able to do what we like—but none the less parts of the great series of causes and effects which, in unbroken continuity, composes that which is, and has been, and shall be—the sum of existence. (244, my italics)

The American pioneer of psychology and founder of the philosophy of pragmatism, William James, influentially wrote that Huxley’s account made consciousness an epiphenomenon, meaning that as the collateral of brain activity, it has no causal efficacy (James 1890, Greenwood 2010). It is sometimes claimed that Huxley is therefore advocating a form of dualism—albeit one that is
possibly either disingenuous or philosophically dubious (Chalmers 2002). Conversely, many critics in Huxley’s own time suspected his views about volition amounted to a thinly disguised determinist materialism that killed off the possibility of right or wrong action and corroded the moral meaning of choice (Lilly 1886). Huxley anticipated this reading with a pre-emptive strike, writing that he was no materialist, and no “fatalist” (2005, 245). Yet even William B. Carpenter, whose physiological researches had shaped Huxley’s own ideas about the nervous system, strongly rejected any suggestion that humans were automata (Carpenter 1875, 1876; Stanley 2014). Was Huxley, then, disingenuous, or confused? To start to answer this, it is instructive to pause over Huxley’s phrase “only intelligible sense”. What this makes clear is the important fact that Huxley is talking about a limited, empirical and a common-sense application of the term free will—and not a metaphysical one.

Greenwood’s subtle paper argues there are reasons to doubt that Huxley was truly either a metaphysical epiphenomenalist, or a dualist. The context of Huxley’s broader theory of knowledge, as I have outlined above, lends support to this claim. It would seem strange and inconsistent if Huxley, from his agnostic position on the nature of conscious experience, was to then to suddenly make a very certain claim about it by arguing positively that as a product of antecedent neurological changes, consciousness could exert no physical effect whatsoever on human behavior, or that mental states have no role other than to be the impotent onlookers of physical events unfolding by material cause and effect. More consistent is that as Greenwood suggests, Huxley held a form of empirical epiphenomenalism, specifically in relation to consciousness.

Huxley certainly denied consciousness any separate role as the antecedent cause of the molecular motions that set a behaviour going, but he did not suggest that thought could have no proximate role in directing actions anywhere along the causal chain. I believe this conclusion in Greenwood’s analysis is borne out on the evidence that Huxley argued for a continuity between neurosis and psychosis at a fundamental level. This suggests that for Huxley, the ‘problem’ for any scientific
investigation of consciousness was a twofold problem of epistemology centred around on the one hand, the limited extent of our epistemological access to the neurosis (i.e. our lack of conscious awareness of the changes in our brain leading to action) and on the other, the problem of empirical access to subjective mental states. This is to locate the argument on familiar and consistent Huxley turf: as a claim about the limits of knowledge and the ultimate obscurity of the operations of human psychology.

William B. Carpenter, in the 1876 preface to the fourth edition of his Principles of Mental Physiology rejected what he called Huxley’s “pronunciamento” that “Man is only a more complicated and variously endowed automaton” (Carpenter [1876] 1888, 284). He read into this a dire determinism that would render right and wrong meaningless, and questioned the grounds for claiming that moral and physical causation could ever be convertible. The existence of moral consciousness was, argued Carpenter, inconsistent with automatism. Praise and blame were exclusively human endowments: hence, we don’t credit silk worms for their industry, or censure the wasp for its sting. Since nothing that could truly be termed choice exists in external nature, then for Carpenter, the very existence of the concept of choice required something directly answerable to it in subjective experience. One couldn’t make sense of choice, he worried, if ‘choosing’ was sensu strictu an illusion. He thought that universality of moral conscience in humans was further evidence that our idea of exercising free moral choice was no illusion. It was by virtue of having an independent will that humans were not “mere thinking automata, mere puppets to be pulled by suggesting-strings, capable of being played upon by everyone who shall have made himself master of our springs of action” (Carpenter quoted in Stanley 2014, p. 219). To choose was to be a man, Carpenter urged, “not a beast” (Carpenter [1876] 1888, 309).

My reading of Huxley also supports Greenwood’s doubt that Huxley intended that being governed by mechanistic principles was to be a puppet. In the words of William Clifford, a fellow agnostic, “the distinction between and automaton
and a puppet is that the one goes by itself when wound up and the other requires to be pushed or pulled by wires or strings” (Clifford 1879, 57). Huxley’s view of the relationship between the physical causes of our actions (of which we are largely not conscious) and our awareness of them does not call for puppetry. What it does do suggest is that while there is nothing in human or animal behaviour that requires causal reference to consciousness, the individual nature of conscious experience may be impervious to our attempts to analyse it empirically.

Bringing this all together, before we proceed to see how this fits into Huxley’s evolutionary ethics, I will consider the important role of associationist psychology in Huxley’s thinking. David Hume, in his Treatise on Human Nature (1738–40) had defined liberty as the power of acting or not acting according to the determinations of the will, commonsensically allowing it, in principle, to anyone not physically prevented from exercising it (Hume 1955). Huxley would assent to this general idea in his own treatment of Hume (Huxley [1894c] 2003, 189). The question of free will was controversial in nineteenth-century thought (Stanley 2014), but Huxley, as we have seen, treated freedom of will empirically rather than metaphysically. He did not, at that commonsense level, see natural laws governing humans to be in radical conflict with the possibility of doing what one desired, claiming it absurd to propose that the statement “I can do as I like’ is contradictory to the doctrine of necessity” (2003, 189).

For Huxley, although thought was caused by physiological changes to which the thinker had no conscious access, humans retained a capacity to act or not according to certain thoughts. Most crucially, Huxley argued that behavior which was originally learned rather than instinctive action could, when practiced, occur without conscious awareness of the mental process that generated it. The example he had given in 1871 was the gamekeeper learning his art, but this claim underpinned his thinking about ethics. Yet it was not Darwinian or evolutionary in its origin. It came via the psychological theories of Hume and David Hartley. In the ‘Prolegomena’ to ‘Evolution and Ethics’, Huxley explicitly recommends
Hartley’s eighteenth-century account of the moral sentiments. For Hartley, our sense of right and wrong derived initially from the sensible experience of pleasure and pain, but was refined by social sympathies and instruction so that in ethical (civilised) human societies, “doing right” no longer came from an instinct, or simple self-interest, but could be developed into rational and highly social form—generating genuine benevolence and the desire to do good from a complex chain of learned mental associations (Hartley 1749). This “acquired dialectic of morals” as Huxley put it ([1894] 2009b, 30) was “the ethical process”.

I have asked the reader to bear with me for some time on Huxley’s naturalistic theory of consciousness to set the scene for my discussion of Huxley’s view about evolution and ethics. In his ethical theory, Huxley continued his practice of distinguishing what was susceptible to empirical investigation from that which he believed could not be empirically known. Mandelbaum is accurate in emphasising the limits of knowledge as the centre of Huxley’s scientific outlook. Huxley thought that boundaries of our knowledge about the natural world might be extended by scrupulously adhering to an empirical scientific method of investigation. However, that same scientific method would also define the limits that properly constrain knowledge claims.

3.7 Strife, Darwin and the cosmos: Huxley’s ethics

Practical knowledge, for Huxley, meant knowledge directed toward action on a human scale. The nature of mind might never be fully knowable to us, free will might or might not be sensu stricto an illusion, but the day-to-day significance of that was actually moot. A philosopher following the direction of wise reason, as Hume had put it in his Enquiry, “sensible” of the temerity of prying into sublime and obscure mysteries about the ultimate nature or causes of things, would surely “return, with suitable modesty”, to concerning themselves with the common problems of the everyday life. Here there were “difficulties enough” to occupy philosophers, without the need for speculation or “launching into so
boundless an ocean of doubt, uncertainty, and contradiction!” (Hume [1748] 2004, 66)

This, Huxley had taken to heart. In the day-to-day world, one could continue to make ordinary, commonsense, use of ideas like freedom, and, in the everyday conception of the word, legitimately choose to act one way, or another, in the absence of external constraint. This was the window through which to dodge the accusation that his philosophy led to determinism: acting on a thought could change the physical course of things—for better and worse, defined as practical matters. Moreover, suppose hypothetically, that being “determined” were the price of right action, what of it? Huxley was prepared in theory to pay it.

I protest that if some great Power would agree to make me always think what is true and do what is right, on condition of being turned into a sort of clock and wound up every morning before I got out of bed, I should instantly close with the offer. The only freedom I care about is the freedom to do right; the freedom to do wrong, I am ready to part with on the cheapest terms to any one who will take it of me ([1870] 2005, 192–3).

I have spent some time examining the nature of Huxley’s arguments about consciousness because he employed the same strategy—separating the empirical realm of human affairs as the level of action from the operation of the world at the level of natural laws, in his often-misunderstood theory of ethics. In 1894, the year after his great Romanes Lecture, ‘Evolution and Ethics’, Huxley had this to say to a correspondent who had suggested he might find Nietzsche’s works profitable.

I will look up Nietzsche’s [works], though I must confess that the profit I obtain from German authors on speculative questions is not usually great. As men of research in positive science they are magnificently laborious and accurate. But most of them have no notion of style, and seem to compose their books with a pitchfork. There are two very different questions which people fail to discriminate. One is whether evolution accounts for morality, the other whether the principle of evolution can be adopted as an ethical
principle. The first, of course, I advocate, and have constantly insisted upon. The second I deny, and reject all so-called evolitional ethics based upon it. (March 23, 1894, Life and Letters Vol. II, p. 360)

The rejection of a “so-called” evolitional ethics had been the theme of his Romanes lecture. In this essay, Huxley had taken the great searching traditions in metaphysical and religious thought as having a common aim. Faced with the subjective experience of the world as full of wonder, but also full of pain, their architects sought to “find out whether there is, or is not, a sanction for morality in the ways of the cosmos” (Huxley [1893a] 2009a, 53). Huxley is sometimes interpreted as simplistically asking this question and replying “no”. On this reading, his famous rejection of the evolutionary process as a source of ethical instruction is sometimes understood as a retreat from the full implications of his own apparently stark message about the struggle for existence. The primatologist and ethologist Frans de Waal argues along these lines, claiming that Huxley’s theory of ethics was in part motivated by “his need to make the ruthlessness of the Darwinian cosmos palatable to the general public” (de Waal 2006, 8): he had depicted nature as “so thoroughly ‘red in tooth and claw’” that he could maintain his support for Darwinism only by a “curious dualism” that “dislodged human ethics” and presented it as “a separate innovation”.

I think this reading is mistaken, and one of the reasons, I will suggest, is that it fails to appreciate that Huxley’s argument about ethics as not primarily an argument about Darwin, or about biological evolution. A careful examination of Huxley’s own claims in the light of his theory of mind and his agnostic principles, suggest a more subtle and penetrating theory was being put forward. The clue to reading ‘Evolution and Ethics’ lies in the incommensurability of the cosmic ‘x’, that “passionless and impersonal” unknown (as he had put it to Kingsley back in 1863) with the anthropomorphomic world. In terms of practical action and its possibilities, the cosmic process, including the process of organic evolution, simply for Huxley simply had “no sort of relation to moral ends” at all (2009a, 83). This, I suggest, is the sense in which Huxley saw nature as being amoral. It
was no use to deny the reality of the pitiless indifference of the operations of nature on its grander, cosmic level to its productions. Suffering was real. But (and Huxley’s account of mentality is crucial here) there was enough room for humans to exercise a form of freedom from those laws, because he insisted that the human animal had both consciousness of its desires and some capacity to act (or not) according to that desire—whatever its ultimate cause might have been. The constraint on behaviour that determined what was ethical was therefore social, and this (following Hume) was the limited but proper sphere of ethics—the only place from which a moral “ought” could be legitimately derived.

‘Evolution and Ethics’ certainly argued that humans were the natural products of a cosmic process in which “on the whole, animals and plants have advanced in the perfection of organization by means of the struggle for existence and the consequent ‘survival of the fittest’” (2009a, 80). But Huxley denied that “men in society” should look to the same process to “help them towards perfection” or to guide them ethically (80). He denied the legitimacy of that move for two reasons. Firstly, principles and “perfection” simply had no proper meaning at all in the scheme of nature’s laws. Secondly, “fitness” had no moral connotation. It was a purely descriptive term, perhaps even a tautology, for the relationship between organic life to its physical environment. This was a point he made explicit in the ‘Prolegomena’, when he wrote, “evolution is not an explanation of the cosmic process but merely a generalized statement of the method and results of that process” (Huxley 2009b, 6). This was the true agnostic’s sentiment. The cosmos could, at best, be in part described. It could not be accounted for.

Responding to Huxley’s Romanes lecture in the Contemporary Review, the agnostic Leslie Stephen (Stephen 1893) also emphasised the gap between the abstraction Nature, and “the concrete facts which are themselves nature”. Like Huxley, he concluded that the mere fact of the struggle for existence in nature did not shed any genuine light on the problems of suffering or the subjective human experience of “evil”, and was irrelevant to the human conception of justice.
Evil exists; and the question of whether evil predominates over good can only ... be decided by an appeal to experience. One source of evil is the conflict of interests. Each beast preys upon others, and man, according to the old saying, is a wolf to man. All that the Darwinian theory can do is to enable us to trace the consequences of this fact in certain directions, but it neither reveals the fact nor makes it more or less an essential part of the process. It “explains” certain phenomena, in the sense of showing their connection with the previous phenomena, but does not show why the phenomena should present themselves at all (Stephen 1893, 158–9).

Stephen concurred with Huxley that the use of morality was to “humanise” the struggle for existence (169).

Huxley’s essay was in part directed against the Spencerian idea that the natural laws of “cosmic” development were identical with the laws of human social development. According to Spencer, the ethical implication of this was that—just like all other products of cosmos—it was the human individuals best adapted to the conditions of their existence who would prosper most, while “individuals least adapted ... shall proper least” (Spencer 1890, 444). This was “the law by conformity to which the species is preserved”. Spencer had abstracted this ethical system from the first-principle assumption that all things—from molecules to the evolutionary change of organisms to human government—could be ultimately explained as an expression of a single unifying physical principle in nature: the persistence of force, driving matter from an incoherent and simple homogenous state to more definite, coherent and heterogeneous complex states (Gold 2010). Spencer had drawn an explicit conclusion from this: that the social state also embodied this fundamental principle.

Slavery, social inequality and war could all be taken as a necessary part of a process driving human societies to a more complex but coherent state. It is doubtful that Darwin—despite what is sometimes construed as an optimistic progress-rhetoric in parts of the Origin (e.g. R. Richards 2014 chapter 2; Hale
—ever saw his theory of evolution as progressive (Davies 2014), in other than perhaps in a limited and non-metaphysical application of that term. He certainly came to rest, by 1871, on the conclusion that progress was not inevitable (Darwin 2004). But Spencer’s argument from physical first principles led him to the notorious view that even the extirpation of one human population by another should be borne with equanimity, because they were part of a process driving human societies to a more peaceful and complex state in which they would no longer be relevant.

Spencer had expressed the foundations of his ethical principles long before Darwin published the *Origin*, writing in *Social Statics* (1851), with specific reference to the Poor Laws, that:

> The well-being of existing humanity, and the unfolding of it into this ultimate perfection, are both secured by that same beneficent, though severe discipline to which animate creation at large is subject: a discipline which is pitiless in the working out of good: a felicity-pursuing law which never swerves for the avoidance of partial and temporary suffering. (Spencer, 1851, 322–23)

Over time, he adopted terminology more familiar to us now as “Darwinian”, even as his convictions about progress and perfectibility became more muted. But in 1890, three years before Huxley’s Romanes lecture, he could still write:

> It is only during the earlier stages of human progress that the development of strength, courage and cunning are of chief importance. After societies of considerable size have been formed and the subordination needed for organising them produced, other and higher faculties become those of chief importance; and the struggle for existence carried on by force, does not always favour the survival of the fittest … It is to be remarked that the self-subordination which defensive war involves, and the need for such qualification of the abstract principle of justice as it implies, belong to that transitional state necessitated by the physical-force-conflict of races; and that they must disappear when there is reached a peaceful state … a society of human beings full adapted to social life (Spencer 1890, 447–8).
Michael Helfand’s is one influential interpretation of Huxley’s ‘Evolution and Ethics’ that has located its meaning in politics (Helfand 1977). Helfand argued that Huxley’s essay was really intended to defend the growing liberal middle class with which he identified from the threat of both laissez-faire Spencerian-style views and socialist polemics. However, this seems an unjustly narrow and conspiratorial reduction of the essay’s sweeping themes. No doubt Huxley did believe that the liberal state was the best thing flawed humans could work with (see chapter 4). He was no political radical. But I think James Paradis (1989) is right to interpret this as a general protest against the Utopian character of many of the nineteenth century’s radical political programs. On my reading, Huxley was fulminating against unjustifiable speculation on (1) the ultimate nature of the cosmos (2) assumptions of telos in the cosmos and, (3) naivety about the perfectibility of human nature. Huxley thought one logical conclusion flowed from Darwin’s great branching model of descent: nature doesn’t progress towards any particular ends, as far as humans are concerned. ‘Nature’ was simply the eternal process of laws unfolding, ultimately unfathomable from our limited human perspective—it had nothing to do with humans, who were merely its accidents. Cosmic nature stood for Huxley not in a personified relationship of active moral opposition to human ends, but rather, was altogether alien to them.

‘Evolution and Ethics’ stresses that the evolutionary process is “incompetent” to furnish reason why “what we call good is preferable to what we call evil” (2009a 80). Huxley’s position on ethics (like his position on consciousness) is therefore sometimes represented as a kind of dualism. Even Paradis—sensitive as he is to subtleties in Huxley’s arguments often overlooked by less penetrating

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15 Huxley’s use of ‘evil’ needs to be read with caution. To modern ears, it can have the ring of religious superstition, and might entice us to think that Huxley was pitting it against an implied metaphysical ‘good’. But note his qualification—“what we call evil”. Huxley was hardly a fan of a priori appeals to abstract ideals. Indeed it would be a new thing in history, he drily remarked, if a priori philosophers were daunted by “the factious opposition of experience” [2009a, 71] and he had rejected, as did Darwin, the very idea of a distinction between ‘material’ and ‘formal’ morality (Darwin 2004, 134.)
commentators—suggests his theory represents an *organic* dualism (Paradis 1978). More recently, de Waal has taken Huxley as arguing that human morality is merely “a thin crust underneath of which boil antisocial amoral and egotistic passions” (10). In de Waal’s view, Huxley’s is a “dim” (7) view of the natural world which takes humans to be “wolves in sheep’s clothing: nice on the outside, nasty on the inside” (8). Huxley, de Waal claims, is arguing that what makes us human (morality) “could not be handled by evolutionary theory”. De Waal has labelled this the “veneer theory” of morality (7). He has linked Huxley’s views to those of some more recent figures in evolutionary science, including the evolutionary biologist George C. Williams, and the biologist and philosopher Michael T. Ghiselin. Pointedly, de Waal writes that “back-and-forth arguments about how to reconcile everyday human kindness” with evolution were “an unfortunate legacy of Huxley” (12). He cites, as one authority on this the brilliant twentieth-century systematiser Ernst Mayr, who, in his imperiously-named *This is Biology*, imperiously pronounced that Huxley “believed in final causes, rejected natural selection and did not represent genuine Darwinian thought in any way” (Mayr 1987, 250; Greene 1999)—three claims that are surely each open to serious challenge.

But there are strong reasons to think de Waal’s claimed link is neither conceptually nor historically straightforward, nor transparent. Williams—writing by his own admission from the perspective of a biologist “not an ethical philosopher” (Williams 1989, 179)—makes the claim that twentieth-century sociobiological insights justify going further than Huxley did in his describing nature as morally *indifferent*. Williams says Huxley should have condemned nature as grossly *immoral*. But he did not. Why? Williams—like de Waal and Mayr—thinks it is because Huxley had an inferior grasp of Darwin’s ideas, and in particular, misunderstood natural selection. Williams offers his own blunt assessment of natural selection: it is a process for maximising “short-sighted selfishness” (180).
This must all be seen in the context of a very twentieth-century argument: Williams’s implacable opposition to group-level selection. Altruism, in this context, is a technical and narrowly circumscribed problem relating to the costs and benefits of behaviours on reproductive fitness in a world where the evolutionary process is reduced to the selection of rival alleles. We are here far from the very conception of moral sentiment and sympathy that is at the centre of Huxley’s nineteenth-century essay. Williams has indeed described morality as an accidental capability—but that is not, because it could not historically be, the argument that Huxley was making.

De Waal also links Huxley’s views, even less plausibly, to those of Michael Ghiselin. In Ghiselin’s famous portrayal of a fundamentally competitive and individualistic economy of nature (Ghiselin 1974), the cornerstones of folk morality—charity and cooperation—are argued to be psychological illusions. Ghiselin claims that if we strip these terms of their sentimentality and expose the evolutionary principles operating beneath, we will find that they really operate (in a manner hidden from our direct conscious experience) in the service of individual selection. He distilled this into the notorious and often-quoted statement “scratch an ‘altruist’ and watch a ‘hypocrite’ bleed” (Ghiselin 1974, 247).

Huxley did not have the concepts of the modern synthesis and population genetics available to him, as Williams acknowledges. But even had they been, there is no reason to assume Huxley would have come down on the side of a stridently adaptationist “gene’s-eye” view of evolution. There is likewise little reason to assume Huxley would have agreed with Ghiselin’s radical (the term is Ghiselin’s own)—assessment that the evolution of society reduces to Darwinism in its most individualistic form, a theory developed by his explicit linking of classical liberal economic theory with the phenomena of sexual reproduction and the social organisation of other species.
It is ahistorical to treat Huxley’s message in ‘Evolution and Ethics’ as one which simply requires updating with sociobiological insight to get to Williams’s type of claim. Nor was Huxley arguing that cooperative behaviour is a phenomenon born of competitive opportunism and exploitation with no authentic existence, and from which we can draw no moral comfort whatsoever (Ghiselin). These are claims about biological nature shaped from within, by the logic of genetics. Huxley was rebelling not against indifferently replicating genes, but against the indifferent regulation of that “macrocosm” which was Huxley’s “cosmos”, extending outwards—to encompass “not merely the world of plants, but that of animals; not merely living things, but the whole fabric of the earth; not merely our star and its satellites, but the millions of similar bodies which bear witness to the order which pervades boundless space, and has endured through boundless time ...”. (2009b, 7)

Huxley’s was a uniquely nineteenth-century battle with a cosmos that was “the expression of a transitory adjustment of contending forces; a scene of strife, in which all combatants fall in turn” (2009a, 49). Huxley’s ethical system also owed much to the psychology of Hume and Hartley. It is surely stretching credulity to claim it as prescient of Williams—the similarities are superficial, at charitable best. As David Hull cautions us, when it comes to the history of ideas, showing actual descent is difficult—but it is all-too-easy to fall for “essential similarities” between concepts, and so into a kind of conceptual morphological idealism (Hull 1988, 17).

3.8 Darwin and the ‘unphilosophical blush’

Frans de Waal also sees Huxley’s view of ethics as “miles removed” from the world that Darwin envisaged (de Waal 2006, 9). He excoriates Huxley’s ethical theory as “thoroughly dualistic” (10). For Huxley, we are in fact “part nature, part culture, rather than a well-integrated whole” de Waal says (10). There is an ordinary sense in which the first part of this observation can be seen as trivial and surely incontestable, and the notion that the human species is a well-integrated
“whole” is eminently contestable (see chapter 7)—but I do not think it is correct to characterise Huxley’s conception of ethics as either dualistic, nor as radically opposed to Darwin’s evolutionary views.

De Waal’s claim is that Darwin (contra, it is supposed, Huxley) “did not see any conflict between the harshness of the evolutionary process and the gentleness of some of its products” (14), and emphasised our moral continuity with nonhuman social animals. This presents the case with a certain kind of emphasis. Darwin did emphasise sociality, but just like Huxley, he also took competitive struggle for resources within groups to have been a potent and indispensable force in the evolutionary process. He had reported in the Descent, citing John Lubbock as an authority, that North American Indians leave the feeble to perish, and that Fijians would bury alive their old and ill. He had also made the grim claim that that indigenous tribes would kill and devour their old women before they would their dogs, since “Doggies catch otters old women no” (Darwin 1845, 214). That story had never left him.

In the Descent, Darwin had surely placed a great deal of emphasis on conscience as both a crucial evolutionary force, and an admirable attribute. The evolutionary origins of conscience, he found in the social instincts of animals, but Darwin thought that “with increased experience and reason, man perceives the more remote consequences of his actions, and the self-regarding virtues, such as temperance, chastity, & c; which during early times are … utterly disregarded, come to be highly esteemed” (2004, 157). Darwin emphasised sociality as the route by which this self-regard might have evolved. But humans giving aid to each other was, at least initially, an incidental result of the instinct of sympathy, originating in social instincts.

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16 The origin and authority for this specific claim, made in the Beagle voyage account Darwin published after returning to London, is obscure. The editor of Darwin’s Beagle Diary, R.D. Keynes, suggests it story may be been given by the Beagle’s captain, Robert FitzRoy and was “possibly false”, based on misleading information from Jemmy Button and/or others. See note 1, p. 224 in Darwin 1998. Darwin, in the Beagle Diary, refers once to the Fuegians as ‘bold Cannabals’ (Darwin 1998, January 21 1833, p. 135).
However, sympathy had come to be expressed among men in particular as something “more tender and more widely diffused” (159). It was on this basis that Darwin urged that social sympathies ought not to be hardened against the poor or weak: “if we were intentionally to neglect the weak and helpless, it could only be for a contingent benefit, with an overwhelming present evil” (159). Society must therefore bear “the undoubtedly bad effects of the weak surviving and propagating their kind” (159), because the alternative was to lose the sympathy and tenderness that actually made us human.

In fact, both Huxley and the Darwin of Descent shared a conviction that (in Darwin’s words) “the moral qualities are advanced, either directly or indirectly, much more through the effects of habit, the reasoning powers, instruction, religion & c., than through natural selection” (2004, 688–9). Huxley and Darwin both believed the reasoned and collective decisions of socialised human beings could therefore ameliorate the worst effects of the individual struggle for existence. This struggle was for Darwin, as much as it was for Huxley, a very present part of human social life, even if, in Darwin’s own words, its Malthusian expression was “impossible not to regret bitterly” (168). Moreover, Huxley and Darwin also agreed on the kinds of actions that could be taken by the civilised polity to effect social progress: “a good education ... a high standard of excellence ... inculcated by the ablest and best men, embodied in the laws, customs and traditions of the nation, and enforced by public opinion” (Darwin 2004, 169). The reinforcement of behaviour through opinion and custom was for Darwin at the heart of ethics (R. Richards 1996), and for Huxley, it was the greatest restraint to anti-social tendencies.

“I have termed this evolution of the feelings out of which the primitive bonds of human society are so largely forged, into the organized and personified sympathy we call conscience, the ethical process,” Huxley wrote in the ‘Prolegomena’, footnoting Adam Smith and Hartley as the authors of its ‘essential features’ (2009b, 30, note). De Waal points out that Darwin, too, found inspiration for his view of sympathy in Smith, who saw moral sensibility to be inseparably bound to,
and produced by, the desire for the good regard of others, such that even were there no god, guilty men would still feel the “natural pangs” of an affrighted conscience (Smith [1759] 2009, 142). For Smith, nature had endowed man with an “original desire to please” and aversion to offending others (140). Huxley now wove this explicitly into his own case: humans had evolved a sense of moral sympathy (i.e. a conscience) that could now be enlisted to forge a human life against the inhumanity of the unsympathetic “cosmos”.

So far as it tends to make any human society more efficient in the struggle for existence with the state of nature, or with other societies, it works in harmonious contrast with the cosmic process. But it is none the less true that, since law and morals are restraints upon the struggle for existence between men in society, the ethical process is in opposition to the principle of the cosmic process, and tends to the suppression of the qualities best fitted for success in that struggle. (2009b 30–31, my italics)

Self-restraint was a condition of a functional society. Had not Darwin, after all, been arguing along the same lines in the Descent, when he lamented that the civilised polity also allowed “the weak ... [to] propagate”, and urged restraint from marriage for those “in any marked degree inferior in body or in mind”—albeit with the sigh this was likely “Utopian” (Darwin 2004, 688). But progress was “no invariable rule” (166).

Neither Huxley nor Darwin was disposed to deny a natural inequality between men in their physical, intellectual and moral endowments. In the ‘Prolegomena’ Huxley scorns a particular kind of evolutionary fantasy no doubt familiar to his

17 As to women, Darwin did not doubt that they were altogether weaker in “intellectual vigour and power” (674), and that the present condition of women was the natural outcome of sexual selection, the “most efficient” force in driving the difference in the appearance between the races. Huxley, arguing in 1865 that women should by all means be educated, was certain that “the big chests ... massive brains and ... stout frames of the best men” would “carry the day” in any fair fight with “the best women”, whose “golden hair would not curl less gracefully” by reason of there being “brains within” (73). The duty of man was to see that “injustice” did not compound “inequality” (Huxley 1865, 75).
nineteenth century readers. Readers are asked to imagine the fate of an idealistic colony that set out to perfect itself by applying the principles of artificial selection to its inhabitants. The colony’s leaders would be laboring under the idea that their laudable aim was based on sound science. They would institute policies that matched the strong and vigorous for marriage, while the weak, deformed or superfluous would be prevented by social exclusion—or, more chillingly, extirpation—from propagating. Huxley was taking obvious aim at the eugenic turn of some Darwinist thinkers. But the reasons he actually gives for rejecting this “pigeon-fanciers’ polity” (2009b, 23) are revealing.

Huxley’s first reason is that the experiment would fail because it is based on a delusion: that humans might be able to surmise, as though with a keen breeder’s eye, who may or may not, turn out to be an ideal citizen. In his own acerbic words:

I doubt whether even the keenest judge of character ... could pick out, with the least chance of success, those who should be kept, as certain to be serviceable members of the polity, and those who should be chloroformed, as equally sure to be stupid, idle or vicious. (23)

Moreover, the best of someone may only emerge in adult life, in response to “practical difficulties” (23). This objection is actually a thesis about the limits of human psychology. It is not an edict against drawing conclusions about what ought to be from biological facts—which is traditionally the point that Huxley is assumed to be making with his parable of the colony.

The second reason for rejecting the Utopian colony is that Huxley declines to directly link human socio-political organisation with organic necessity in the way one might for other species, on the basis that human beings are—unlike bees—socially and intellectually flexible. No human is predestined to his or her place in human society. Moreover, the most distinctive natural characteristic of human societies is the complex social bonds that sustain them. This is a thesis in
evolutionary psychology. But it is also a thesis about the human place in the natural world. Human social organisation might have been a product of natural laws. But for Huxley, its future state was in no wise implied by its present condition. Its existence was fragile, contingent and threatened, ultimately, by nature itself.

Huxley certainly saw “no limit to the extent to which intelligence and will, guided by sound principles of investigation, and organized in common effort, may modify the conditions of existence” (2009a, 85). Crucially, for both Huxley and Darwin, whatever the struggle in nature might have made of men in the past, this could change in the future. “Much may be done to change the nature of man himself,” Huxley wrote. And if (he added in a footnote) some would criticise his use of the word ‘nature’ here, they might reflect that “the manifestation of the natural tendencies of men is so profoundly modified by training that [the term] is hardly too strong” (116).

Huxley’s text provides ample evidence that he was not arguing, as de Waal suggests, that humans are ultimately selfish brutes. His ethical system is no veneer. Yes, the long period of human history had been a “severe” (85) training ground, and humans shared a long-ago common ancestry with the savages and the carnivores (was this not tautological if one accepted Darwin’s account of descent?). But (reversing the order of the terms in which Huxley put this point to underscore mine) the philanthropist follows nature just as much as the thief.

Some contemporary debates in the philosophy of biology tend to treat the notion of whether there is human nature as an abstract philosophical problem. However I have been insisting that Huxley saw it as an empirical proposition. How humans behaved—thief or philanthropist, educating the poor or starving them, meretrichious sophist or sober seeker of facts—was a matter of observable fact. If, for Huxley, there was no question that the cosmic process could no more lead to ‘perfectibility’ than human intervention could stop tides from ebbing and flowing or the wind from wearing down mountains, there was also no need to turn to the
macrocosm of the universe as if it issued eternal imperatives about behaviour in a form relevant to humans.

The microcosm of the human world presented problems that could be dealt with, in “the only intelligible sense”: with practical action on a human scale. There was disease and starvation; there was pain; there was, above all (humans being constituted as they are) consciousness of this suffering: “pain and sorrow and wrong are realities” (Huxley 2009a, 71). One did not need to defer to a priori metaphysical systems to get to this conclusion. One simply had to have sensibilities and senses, and powers of observation, to deduce that suffering was neither morally edifying (as the theologians might have it) nor to be borne as the great upswing of some greater evolutionary promise. And empirical knowledge transformed into action was the means by which suffering might be alleviated: this is where Huxley located the meaning of his mission. If Darwin’s theory of descent with modification had offered a means to strip the metaphysical veils obscuring the origins of human nature, it is not, in my view, true that the sum of what Huxley really saw exposed was de Waal’s wolf that could at best be tricked up as a sheep. For what sort of wolf could check his carnivorous urge on feeling the prick of conscience? More pertinent in Huxley’s mind perhaps, what sheep could unphilosophically blush, with Pliny, when confronted with his miserable origins (in the phrase of La Mettrie)?

An elaborate examination of Eastern and Hellenic philosophy in ‘Evolution and Ethics’ is often glossed over by commentators whose perspective is Darwinian biology. But its inclusion was crucial. Huxley thought the great philosophical traditions like Buddhism had correctly seen that suffering is inscribed in the cosmos. But the ingenious metaphysical systems that humans had erected to deal with this all perpetuated the same error. What was needed to combat the cosmos was not to submit to its laws or attempt to dissolve into it but to recognise the nature of the human self. Fractured and imperfect as may be, this was the means to perceive the nature and limits of life’s relationship to it. One could push back the boundaries of natural knowledge so far—humans had the luck of that
evolutionary inheritance. But the human inheritance was also psychological frailty and intellectual fallibility—rigorous method was therefore needed to set the bounds of knowledge claims. Huxley had written to the physiologist Michael Foster that ‘Evolution and Ethics’ could equally have been titled ‘Satan the Prince of this World’ (Huxley to Michael Foster, May 26 1893, Life and Letters Vol. II, p. 357). But Huxley’s Satan was no fallen angel: Satan was the power of thought to deceive and delude, which was the real cause of psychological suffering.

Wrote Huxley, in ‘Agnosticism’ (1889): “When the positivist asks me to worship ‘Humanity’—that is to say, to adore the generalized conception of men as they have ever been and probably ever will be—I must reply that I could just as soon ... worship the generalized conception of a ‘wilderness of apes’” ([1889] 1892, 288). He added:

I know no study ... so unutterably saddening as that of the evolution of humanity ... Out of the darkness of prehistoric ages man emerges with the marks of his lowly origin strong upon him. He is a brute, only more intelligent than the other brutes, a blind prey to impulses, which as often as not, lead him to destruction; a victim to endless illusions, which make his mental existence a terror and a burden (289).

Knowledge of nature was the means to break the spell of these illusions, but the boundaries of knowledge claims needed to be strictly circumscribed, lest conceit lead (as Huxley thought it had for Spencer, the materialists or the positivists) to the instantiation of another kind of illusion—another kind of fruitless burden.

Darwin himself had placed suffering at the centre of his conception of evolutionary change. He had matter-of-factly naturalised it. By his theory, Darwin said in the Origin, we need no longer marvel at “some instincts being apparently not perfect and liable to mistake, and at many instincts causing other animals to suffer” (1859, 475). Darwin didn’t explicitly add (although he might have) that neither need we perceive of suffering as the theologians have, as something to be explained away with an invented tale about its moral value, lest...
the existence of suffering, of the vile and molluscous, give cause to doubt the creator's benevolence, omniscience, or both. He merely let the thought stand.

Darwin's tone and emphasis may have been different to Huxley's, but no less than Huxley he saw man's place in the world as perennially threatened by his inheritance, subject to a sometimes "severe struggle" (677), and vulnerable to "sink[ing] into indolence (688)". Darwin, too, thought he might as soon worship a monkey as "a savage who delights to torture his enemies, offers up bloody sacrifices, practises infanticide without remorse, treats his wives like slaves ... and is haunted by the grossest superstitions" (689). As to speculation about higher and future destinies—"we are not here concerned with hopes or fears, only with the truth as far as our reason permits us to discover it" (689). In this statement of ethical principle, Darwin and Huxley chimed as one.
CHAPTER 4. NAKED BARBARIANS, BEASTS OF GOOD HEART: ANCESTRAL PERSPECTIVES

That is a grand & almost awful question on the genealogy of man to which you allude. It is not so awful & difficult to me, as it seems to be most, partly from familiarity & partly, I think, from having seen a good many Barbarians. I declare the thought, when I first saw in T. del Fuego a naked painted, shivering hideous savage, that my ancestors must have been somewhat similar beings, was at that time revolting to me, nay more revolting than my present belief that an incomparably more remote ancestor was a hairy beast. Monkeys have downright good hearts, at least sometimes ...

CHARLES DARWIN TO CHARLES KINGSLEY, 1862

4.1 “Whence have these people come?”

Darwin’s proposition about the “genealogy of man” linked humans to a “community of descent” with “shivering, hideous savages”, and monkeys with “downright good hearts”. Yet what did it really mean to say that man’s “incomparably more remote ancestor was a hairy beast”, as Darwin had put things in a letter to Charles Kingsley in 1862 (DCP, Letter no. 3439)? In 1862, it certainly meant that to assert this publically would come at social risk. Darwin could go on to confess in this letter to Kingsley to having the makings of “a curious essay on Human expression & a little more on the relation in mind of man to the lower animals.” But “How I shd. be abused if I were to publish such an essay!”

It is often assumed that it was the awfulness of being from “lower animals” which was the source of the ontological queasiness many felt about the Darwinian formulation of common descent, but both Darwin and Huxley seem, at times, to have been much more at ease with the fact of man’s ancestral relationship to distant beasts and obscure hairy or aquatic ancestors than they were with “civilised” man’s potentially more accusing relatives—the naked “Barbarians”. Writing to Kingsley, Darwin called human genealogy a grand question, and
almost awful. But it was not, quite, awful for one who had experienced barbarians. That experience, Darwin suggested, gave him a different perspective.

The quality that Harold Bloom has referred to as cognitive originality in literature (see Introduction) may be just a term for a highly developed ability to read and interpret things from a novel perspective. In this chapter, I begin by considering Darwin's perspective on—and from this perspective, his reading of—the people of Tierra del Fuego. Darwin the voyaging naturalist was simultaneously awestruck, horrified and moved by what he took to be the tentativeness of their humanity, and this, in turn, opened the way to a different perspective on what it was to be human at all. Some 40 years later, the scientist of the Expression of the Emotions would take an explicitly zoological perspective in his analysis of human beings, stripping human emotions of their commonsense familiarity, while in the Descent of Man, published just the year before, Darwin described the emotional states of animals using ordinary human terms. The effect of this double manoeuvre was to foreground the animal in the human, while humanising animals. The “Barbarians” confirmed this unity of descent, but Darwin continued to draw distinctions between the state and advancement of natural, compared to “civilized”, humans. In the second part of this chapter, I explore a well-known controversy between Huxley and the Russian naturalist Piotr (Peter) Kropotkin over their interpretations of what I will call the Darwinian “state of nature” by reading it as a product of contested perspectives on these shifting terms: human/animal/ “Barbarian”. In several prominent accounts, the disagreement between these two natural philosophers is characterised as a political one, which sets up a picture of Kropotkin, the socialist radical, sparring with Huxley, the gloomy Malthusian defender of the Victorian state, over whether Darwin’s evolutionary theory implies that individualistic competition or “mutualism” and co-operation ultimately drives evolutionary change. I argue that the difference is more profound, and relates to a crucial question, one that repeatedly shows up in my later readers of Darwin, including Engels, Singer, Wilson and Gray. The
question is whether or not nature can, in any meaningful way, be said to be a site of moral meaning.

Since this question has dimensions that extend to both humans and non-humans, I begin this chapter with some analysis of how Darwin related humans and animals in his discussions of evolutionary common ancestry. Darwin allowed the argument for his theory of descent to rest upon the eloquence of the body of evidence he amassed to support it. All that evidence pointed toward man having descended from some lowly-organised form. Of the “older and honoured chiefs in natural science, many unfortunately are still opposed to evolution in every form” Darwin wrote in a low-key manner, on page two of the first edition of the *Descent of Man*—here using the word “evolution” with reference to his own theory for the very first time in his published writings (Freeman 1977). But he let the facts do the talking.

The homological structure, embryological development, and rudimentary organs of a species, whether it be man or any other animal, to which our attention may be directed, remain to be considered, but these great classes of facts afford, as it appears to me, ample and conclusive evidence in favour of the principle of gradual evolution. (Darwin 1871, 2)

Coming to Tierra del Fuego for the first time on the *Beagle* in 1832, Darwin had found its inhabitants “the most curious & interesting spectacle I ever beheld” (*Beagle Diary*, December 18 1832, p. 122). “I would not have believed how entire the difference between savage & civilized man is,” he wrote. This statement is all the more striking here since, before, he arrived in Tierra del Fuego, its people were not, in fact, wholly unfamiliar to Darwin. Aboard the *Beagle* were three young Fuegians, who had been abducted and taken to England on a previous *Beagle* voyage. There, they had been paraded before Queen Adelaide, and briefly, sent to an infants’ school in Walthamstow. A fourth Fuegian had died of smallpox shortly after landing in Portsmouth (Hazlewood 2000). Now, the *Beagle’s* captain, Robert FitzRoy, was conveying these people back home, apparently
optimistic that they might persuade their wild-living compatriots to adopt more
civilised and Christian ways. ‘Jemmy Button’, ‘Fuegia Basket’, ‘York Minster’ and
‘Boat Memory’ (who had died in Portsmouth): these names, bestowed on the
Fuegians by their European abductors, already tell a story. They simultaneously
infantilised and trivialised the captives, and emphasised them as commodities of
colonial trade.

Darwin, on the *Beagle*, observed the man they called York Minster to be
“taciturn”, “morose” and passionately intense. The young woman of the trio,
Fuegia Basket, was described as modest and quick at learning languages, having
picked up some Portuguese and Spanish as well as English. The third Fuegian,
Orundellico (called by the voyagers ‘Jemmy Button’), was described by Darwin as
“vain”, but of “nice disposition”, “merry and sympathetic”, and given to “admiring
himself” in a looking glass (Darwin 1845, 207). When Orundellico encountered a
party of Fuegians from a different language group to his own, Darwin recorded in
his December 18, 1832 diary entry that these people “immediately perceived the
difference” between themselves and this young man from the Yaghan clan. (They
also “noticed [York Minster] in the same manner ... & told him he ought to shave,
& yet he has not 20 hairs on his face”.)

Orundellico returned to his own home country in January of 1833. In his *Journal
of Researches*, Darwin would write candidly of his wonder that ‘Jemmy’ was “of
the same race” and “doubtless partaken of the same character” with the
“miserable, degraded savages whom we first met here” (Darwin 1845, 207–8).
When, in early 1834, the *Beagle* returned to visit the country, ‘Jemmy’ had
resumed the life of his people. Darwin found his former shipmate scarcely
recognisable “without a remnant of clothes ... his hair, hanging over his
shoulders; & so ashamed of himself, he turned his back to the ship as the canoe
approached.” It was a “complete & grievous ... change” (*Beagle Diary*, March 5
1834, p. 226). Yet when he was “clothed and the first flurry over, things wore a
very good appearance.” When the *Beagle* bid Orundellico and his country a final...
farewell on March 6, Darwin wrote, “I hope & have little doubt he will be as happy as if he had never left his country, which is much more than I formerly thought” (227).

The Fuegians, as recorded in his Beagle diary, appeared variously to Darwin as the “representations of Devils on the Stage” “abject”, and “distrustful” (December 18 1832, p. 122). They were also described as excellent mimics, delighting in song and dance, and as people with whom friendship could be readily established. He reported that, like animals, they slept coiled up on wet ground. Like children, they delighted in “trifling presents” and were difficult to satisfy: “the last & first word is sure to be ‘Yammerschooner’ which means ‘give me’. They were “such thieves & so bold Cannabals” (January 20 1832, pp. 134–5). At times, they yelled wildly and leapt, and were pronounced scarcely like earthly inhabitants at all. When Orundellico was reunited with his family, the meeting was “not so interesting as that of two horses in a field” (January 23, 1833 p. 137). Their eyesight was declared—as that of a wild bird might be—far superior to the Englishmen. The instinctive physical courage of one party of Fuegians, Darwin found to be threatening like “a wild beast”—as a tiger would tear at you, they would “endeavor to dash your brains out” (January 28 1833, p. 139). Yet “in contradiction of what has often been stated, 3 years has been sufficient to change savages, into, as far as habits go, complete & voluntary Europeans”. Whatever other ends the “excursion” of the (kidnapped) trio to England might produce, it would not, Darwin concluded, be conducive to their happiness (February 6 1833, p. 143).

The condescension of all this jars to modern ears—dripping, as it seems, with colonial prejudice. Yet it would miss a crucial point simply to emphasise derogatory or patronising terminology and declare Darwin’s attitudes to be evidence of racist European attitudes. That comes rather too easily but gives us, historically, very little. It would be equally missing the point to read the genuine

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18 See note 16.
and humane curiosity and even kindness which Darwin expressed at times towards the Fuegians as evidence that he was a cultural radical who regarded in them as his *moral* equal. What is revealing about his impressions is the way in which they shift so quickly between what might seem, to us, contradictory or confused sorts of claims. How are we to read this? Is Darwin saying the Fuegians are animals, “savages”, children, quasi-civilised half-humans, or even civilisable at all? Are they morally capable and teachable, or diabolical, shifty and dangerous? Yet surely there is no genuine contradiction in all of this. What Darwin seems to have read in the Fuegians’ strangeness was that they were simultaneously the embodied possibility of *all* these things: the almost-animal, the wild “Barbarian”, and the morally teachable childlike human who, by direction of habit might live, “as far as [their] means” allowed, “like an Englishman” (February 6, 1833, p. 143). Each of these states was for Darwin expressed at different times, and in different measure, according to immediate environmental and social circumstance. As he wrote to his sister Caroline in March 1833, emphasising a point that would become characteristic of his later, evolutionary, perspective, “the difference between a domesticated and a wild animal is far more strikingly marked in man” (*DCP*, Letter no. 203).

### 4.2 From the “bony girdle of the hips”: the structure of descent

In England thirty years later, it was not living human bodies, but the bookends to all embodied life—embryos and skeletons—that were the centerpiece for Huxley’s famous salvo in defence of man’s Darwinised descent. *Evidence as to Man’s Place in Nature* was, in part, the re-working of a series of lectures Huxley had given to working class men, to whom he had boldly declared that “there cannot be the slightest doubt in the world that the argument which applies to the improvement of the horse from an earlier stock, or of ape from ape, applies to the improvement of man from some simpler and lower stock than man” (Huxley [1863b] 2014, Lecture 6). He added—ever with an instinct for the political—that
as “Mr. Darwin has said nothing about man in his book [the *Origin*]," the views he offered were his own.

To firmly establish man as a modified product of nature no different in principle to any other animal or living thing, Huxley had to “demonstrate ... the impossibility of erecting any cerebral barrier between man and the apes” (Huxley [1863a] 2001, 99). *Man's Place in Nature* has little to contribute to the quintessential *Origin* theme of speciation via natural selection, and Huxley granted natural selection only provisionally, in cautious terms that were not exactly a ringing endorsement. Huxley was unconvinced by Darwin’s arguments for natural selection, and *Man's Place* was by no means written to “persuade” others on the specifics of that theory (2001, 128). Huxley did want to persuade his readers that the prominent Victorian anatomist Richard Owen was not to be believed when he insisted that there was structure in the human brain that confirmed man’s physiologically unique and metaphysically privileged status. This was a dispute that pre-dated the publication of the *Origin*. It was not physiologically possible, according to Owen, for apes to transmute into men.

Owen had told the Linnean Society in 1857 that the structure of the human brain was evidence of “peculiar mental powers” which warranted classifying humans as a “distinct subclass” of mammals, for which he had proposed the term *Archencephala*. Structural modifications including bipedalism were, Owen pressed, sufficient to warrant this classification on the basis of external “zoological” characters alone. But it was “psychological characters”—the “extraordinarily developed brain”—and “cerebral characters” on which Owen staked his argument for man’s “ordinal distinction” (Owen 1857, 33).

In *Man's Place in Nature*, Huxley argued that descent with modification from common ancestors was the only explanation for the zoological affinities between humans and the greater apes that was consistent with the evidence. In a six-page riposte to Owen, appended to *Man's Place* as ‘A Succinct History of the Controversy Respecting the Cerebral Structure of Man and the Apes’, Huxley
openly suggested that Owen was ignorant of, or—worse—had misrepresented or even suppressed the evidence of fellow anatomists when he claimed that the so-called “hippocampus minor” (a small fold on the occipital horn towards the back of the brain) was peculiar to humans, meaning it was impossible that man could have evolved by some form of natural modification from the higher primates. There was no such definitive difference, Huxley wrote—and Owen knew it. Huxley’s attack was all the more loaded because the authors he accused Owen of misusing were hardly evolutionist radicals, but hostile witnesses, “decided opponents of all forms of the doctrine of progressive development [who are] above all things, lovers of truth” (Huxley 2001, 118).

A number of writers have examined the Owen-Huxley “hippocampus” controversy through a sociopolitical lens (Desmond and Moore 1992; Rupke 2009). From this perspective, the matter turns on more than the mere facts of the structure of the brain. What is at stake is scientific prestige and professional authority. For Desmond and Moore, Man’s Place is about nailing Owen. Darwin becomes on this interpretation Huxley’s weapon, rather than his cause. Huxley, “forcing the agenda” for a naturalistic theory of human origins, seizes the day for “rationalist” scientists, against the “providential platitudes” (Desmond and Moore 1992, 516) of those who, like Owen, would not give up on the necessity of a Creator. I admit this background, but do not see it as inconsistent with accepting at face value the proposition that—the politics, personalities, and psychology notwithstanding—Huxley was ultimately motivated by his desire to make an unambiguous claim for the non-metaphysical status of man in the world. If this meant nailing Owen, it only made it a greater pleasure.

Man’s Place constructed the case for common descent from femur and blastula—vertebra by vertebra, tooth by tooth, from “the bony girdle of the hips” (2001, 71). The frontispiece to the volume was Benjamin Waterhouse Hawkins’s representation of a skeletal procession of figures, running from gibbons via the great apes and to erect, bipedal man. This illustration is now iconic: a paradigm pictorial representation of the evolutionary story. At the time, Huxley’s skeletons
had the Duke of Argyll, for one, shuddering: Huxley’s views were “grim and grotesque” (quoted in Desmond and Moore 1992, p. 516).


The skeletons, skulls and bony pelvises are famous, but Man’s Place is equally dependent on evidence from embryology. Embryos, Huxley suggested, may be more potently persuasive than skulls: “The study of development affords a clear test of the closeness of structural affinity, and one turns with impatience to inquire what results are yielded by the study of the development of Man” (Huxley 2001, 67). A developing puppy, he wrote, is hard to discriminate from the developing human child. Man’s place in nature is circumscribed by the facts of birth, and death—the price paid by all individuals who have preceded the currently living in the long line of slow ascent from beasts to accidental men. We must take the Darwinian view, Huxley told his working men, “or look on the whole of organic nature as an enigma” (2014, Lecture 6).

Huxley concluded that the differences between men, gorillas and chimpanzees were not as great as those between gorillas and lower apes (like the gibbons), but there was no extant common ancestor: “in the present creation, at any rate, no intermediate link bridges over the gap between Homo and Troglodytes” (106).
Despite this deft and unsentimental laying out of the evidence for human ancestry, Huxley soothed anxious readers that no one was more convinced than he “of the vastness of the gulf between civilised man and the brutes, or is more certain that whether from them or not, he is assuredly not of them” (112). Nor, and pointedly, was civilised man “of” the savages. Huxley had promised the working men who came to his lectures that the moral and intellectual difference between speechless men and the highest animal would still be profound. He similarly placated the readers of Man’s Place. They need not worry that poets, philosophers or artists are:

... degraded from [their] high estate by the undoubted historical probability, not to say certainty, that [man] is the direct descendent of some naked and bestial savage, whose intelligence was just sufficient to make him a little more cunning than the Fox, and so much more dangerous than the Tiger (2001, 112).

“Civilised” man, in comparison to the bestial savage was, Huxley thought—ascending in keeping with that thought to more Romantic heights of rhetoric—“the Alpine traveller, who sees the mountains soaring into the sky and can hardly discern where the deep shadowed crags and roseate peaks end, and where the clouds of heaven begin” (113).

4.3 An “undirected flow of nerve force”: the zoological in Darwin’s Expression

“Mr. Darwin’s hypothesis” (Huxley 2014, Lecture 6), didn’t just have implications for nature’s human products. Common ancestry also raised obvious questions about how a naturalised and evolved human mind might relate to mentality in nonhuman animals. Did the so-called lower animals think, feel or reason? Some later nineteenth-century writers—like Darwin’s young friend, the biologist and physiologist George Romanes—were happy to accept that animals experienced a wide range of emotions and feelings. Others, like the pioneer of animal behaviour studies Conwy Lloyd Morgan, and the psychologist Wilhelm Wundt, were less
sure. Wundt thought the willingness of some to see “the intellectual achievements of animals in the most brilliant light” was due to “ignorance” of proper psychological and scientific method (Wundt [1894] 1970, 342; see also King and Viney 1992).

Huxley may have had his civilised men ascend poetically to roseate peaks, but there was little that could be termed Romantic in the language of Darwin’s *Expression of the Emotions in Man and Animals*. “If our ears had remained movable,” Darwin wrote baldly, “their movements would have been highly expressive, as is the case with all the animals that fight with their teeth” (Darwin 1872, 365). The *Expression* completed the story of descent with modification that Darwin had begun to tell with the *Origin*. Darwin was unambiguous about his intentions. He wanted to put beyond doubt that “man is derived from some lower animal form”, and to confirm the unity of descent of the human races, although he admitted that for his own part such confirmation “was hardly needed” (Darwin 1872, 367).

Darwin’s natural history of the human emotions stripped them of all sentiment, divorced them from the comforting familiarity of everyday experience and terminology, and claimed they had frank homologies with animals. Ordinary human experiences, from anger to astonishment to shame, were literally represented, as he made their evolutionary origins the subject of analysis. Anger was rendered back to readers as a “senseless” action in part attributable to “the undirected flow of nerve force” (349). Other sensations and emotions, he wrote, “are called depressing” (349, my italics), while affection “in as far as it is a pleasurable sensation, excites the ordinary signs of pleasure” (350).

Darwin urged that his research suggested there were good reasons to question even the deepest assumptions about the nature and origins of human gestures and expressions. Some gestures usually viewed as social conventions were, on
Darwin’s reckoning, innate. Others, coming so apparently naturally were, Darwin argued in fact learned.

When ... we turn to less common gestures in ourselves, which we are accustomed to look at as artificial or conventional,—such as shrugging the shoulders, as a sign of impotence, or the raising the arms with open hands and extended fingers, as a sign of wonder,—we feel perhaps too much surprise at finding they are innate ... Certain other gestures, which seem to us so natural that we might easily imagine that they were innate, apparently have been learnt like the words of a language. This seems to be the case with the joining of the uplifted hands, and the turning up of the eyes, in prayer (352–53).

Darwin scrupulously avoided the sort of speculative language that could be seized upon or misconstrued by the mischievous or malevolent. Some unexpected receptions of the Origin had showed him that metaphors and carelessly used terms could be risky. Alfred Russel Wallace had suggested that “natural selection” may have been an unwise choice of words, because it connoted an active agency. Others, including Charles Lyell and Asa Gray, could not see how Darwin’s theory could work were nature not in fact guided by some actively selecting hand.

Darwin was also careful to avoid what might look like overstatement in the Expression. “We may likewise infer” (362) “we may confidently believe” (361) are the kinds of cautious terms that temper the work’s conclusion. It “seems to me improbable” (361). “It can hardly be doubted” (364). The idea was to persuade readers with the overall weight of many small pieces of evidence, rather than to stake a claim on a single trumping argument, or to employ Huxley-style rhetorical fireworks or startling literary devices. As Cain (2009) has put it, underlying the collection and presentation of the data itself was a strategy: Darwin wanted to assemble the facts “with a view to showing their independence and diversity” (Cain 2009, xxiv). Diversity of sources was “an asset, especially when different information led researchers to identical conclusions” (xxv). Laying
out his reasons for concluding that the origins of blushing were to be found in anxiety about the attention of others directed to personal appearance, and not in shame over moral conduct, Darwin commented, “[My reasons] are separately light, but combined possess, as it appears to me, considerable weight” (327).

Darwin also sought to forestall criticism by anticipating possible counter-arguments or protests. No doubt sensitive to Victorian anxieties about the metaphysical status of free will in the face of accumulating knowledge about the physiology of the nervous system (Stanley 2014), Darwin remarked with calm circumspection, “[T]hroughout this volume, I have often felt much difficulty about the proper applications of the terms, will, consciousness and intention” (357). He wanted to be clear that he had thought about the problem. Yet words needed to be chosen with great care. “Even such words as that ‘certain movements serve as a means of expression’ are apt to mislead, as they imply that this was their primary purpose or object,” wrote Darwin (357).

This sort of formulation was typical of a textual strategy designed to methodically and scientifically separate terms and concepts from the everyday commonsense usage that may have tended to obscure their origins and nature. Darwin’s message was simple: intensity of conviction and the apparent naturalness of a belief are not reliable indicators of its truth. It was in no wise to be accepted as obvious that the human emotions were either unique when compared to the expression of emotion in animals, nor immune to scientific investigation. They could, in fact, be most plausibly accounted for as the end product of laws and mechanical processes no different in principle in man to those in dogs, cats or baboons. Pointedly, Darwin pressed the argument that “many observers are unanimous that these expressions can be recognised in the various races of man” (329). Proving his theory of common ancestry also necessitated putting the last nail in the coffin of an old enemy, polygeny (Desmond and Moore 2010).
The *Expression* held another message: it demolished the foundations for the kinds of arguments that had seemed to treat dualism a logical necessity. Once again, Darwin’s method was to let his point rest on the facts, without stating his own opinion of the metaphysics, or entangling himself in arcane debates about matters such as free will, which for many (like William B. Carpenter) was constitutive of human identity. Darwin could find no grounds for believing that “any inherited movement, which now serves as a means, of expression, was at first voluntarily and consciously performed for this purpose … every true or inherited movement of expression seems to have had some natural and independent origin” (356). Will, he wrote vaguely, in so far as it intervened at all, did so “in a remote and indirect manner” (354).

4.4 ‘Our poor relations’: on the zoophilic

Paul Ekman (2009) identifies, as among Darwin’s key and novel contributions to our understanding of expressions, his analysis of emotions as separate or discrete entities, and his treatment of facial expressions as universal. These insights were used to support his evolutionary picture of the emotions in the *Expression* and *Descent*. Darwin identified what he was willing to call emotion in the expressions and behaviours of primates, dogs, cats, horses, and domestic chickens, although in doing so, he often fell back on anecdote and second-hand reports, often unverified (Burghardt 2009, Sober 2005). Ekman notes that increasingly over the twentieth century, and especially under the influence of behaviouristic approaches to psychology, claims about mental states in nonhuman animals came to be sceptically regarded as an error of “anthropomorphism”.

The *Expression* sold well, and was published with relatively little scandal (Ellegard 1990). After all, its message—although expressed with a directness that sometimes seems surprising even to modern ears—was not new. Darwin may have been famously brief about human descent in the *Origin*, but no one had missed the deeper point in 1859. But the theme of shared ancestry, and the claim
that animals display what can be legitimately described as emotions, could be treated from a different kind of perspective to Darwin’s. King and Viney (1992, 192) point out that in the later nineteenth century, many authors explicitly “used a sentimental orientation as a defence against Cartesian mechanism” and its conception of animals as unfeeling automata. Popular magazine articles often used anecdote and observation to support claims about the emotional, moral and intellectual capacities of animals.

In the year the Expression was published, a zoophilic colonel (later, a Conservative member of the House of Commons) who did not share Darwin’s care to avoid effusive language, contemplated the fate of animals in the face of “the insatiate rapacity of man” in a book entitled Our Poor Relations (Hamley 1872, 27). The central theme of this work was that acts of cruelty to animals had a direct and inverse relationship to the progressive moral evolution of humankind. Hamley argued that cruelty had become instantiated in the human race through man’s habit of putting his own interests before those of fellow creatures. Over time, this tendency to assert human interests had combined with a “germ” of violence deep in human nature, and taken hold. Cruelty was in this argument not some obscure stain or mysterious original sin, but the outcome of the practical career of a dark human urge to violence, which he traced through savages and Aztec priests, via Roman amphitheatres and badger-baiting, to its more refined incarnation in the English pursuits of blood sports … and scientific vivisection. “No longer sacrificing to the ancient gods,” Hamley wrote, “we still lay living offerings on the shrine of the chief divinity in modern mythology—namely, Science” (32). As an example of how privileging the human perspective over that of other animals had instantiated cruel behavior as natural, Hamley pointed to experiments carried out on monkeys by surgeons trialing an operation to cure squint in humans: “the monkey would not care if the whole human race squinted” (32).
Hamley’s animals were rich in sentience, and in sentiment. They were also, unlike humans, morally *innocent*. “Everyone who has domesticated some strange, shy creature can testify to the wealth of character which it came to display in the ripening warmth of intimacy.” (9) Donkeys were “charming”. Young pigs were “delightful” in their gambols, though he felt it more morally instructive to “ignore the sensual aldermanic life of the mature porker” (11). Monkeys produced “endless fun ... fresh comedy ... brilliant farce”, and were “careful always to hold the mirror up to nature and to man!” (12). Hamlet could give no useful advice to an ape. The Dane’s “pale cast of thought” was the affliction of a singularly human perspective. “[A] metaphysical monkey, mooning over his barren philosophy, would sit in dismal discord with the surrounding fun.” (12–13)

*Our Poor Relations* struck an ambivalent attitude towards science, contrasting with its ebullient, unbridled and generalised zoophilia. Hamley was sympathetically approving of an earlier style of gentlemanly naturalist, but, “by this term we are far from intending to signify the experimenters on the nerves and muscles of dogs, or the impalers of beetles and butterflies” (8). Yet as Hamley was compelled to admit, Nature could be “no less harsh than man in dealing with her inarticulate offspring”, showing “fitful favour, capricious severity” (41). Every gentle antelope must run for its life. In cold climates, “the frost mocks the misery of those whose food is the marsh or the pool” (47).

*Our Poor Relations* was neither a Jeremiad, nor a lament for a paradise lost. Its principal message was a progressive one, in which changing attitudes to the treatment of sensitive fellow creatures played a large and decisive role in human moral improvement. The dark tones of its descriptions of competition and indifference in nature may have seemed to invoke Malthusian battles reminiscent of the *Origin*. But Hamley’s conclusions bore little similarity with those of the sternly unsentimental Darwin of the *Expression*. As humans morally evolve, Hamley argued, they cease to be like the savages or the bloodthirsty emperors of history, or sport for blood, but become kinder towards animals, recognising them
as kin. Physical kinship with animals did not degrade humans, as many anxious Victorians had felt. It doubly elevated them. In the first place, humans were humbled by this shared ancestry. And the “simple, clear” nature of animals was itself a direct mirror to human virtues and vices. In the renunciation of cruelty to animals, humanity’s moral progress would be affirmed.

Hamley typified a certain ambivalent attitude towards Darwinian evolution in the particular. Natural selection, on the one hand, with its morally dubious Malthusian overtones, could be held “at arm’s length, like some exotic, possibly poisonous, species of reptile” (Turner 1980, 61). Common ancestry, though, could be less threateningly rendered as moral kinship, and this familial relationship deployed as a rhetorical strategy in the Victorian war against animal cruelty. What is striking is the manner in which Our Poor Relations dealt with (or rather, declined to deal with) the implications of the objective facts of the brutality in nature, even as it clearly stated them. This approach, as Turner puts it, was to soften Darwinism with a “healthy dose of godliness”. It stressed “the blood kinship of human beings and beasts, but it mitigated the bestiality of the latter” (1980, 62).

Darwin’s own writings were increasingly pointing to the futility of looking for a metaphysical salve for human origins in a progressive moral tale about evolution. While Hamley wrote of charming pigs and good-humoured monkeys with an unabashed and benevolent anthropomorphism, Darwin probed the chthonic depths of rage, fear and lust, finding incipient violence in the wide-mouthed yawn of a baboon. By 1881, he was drawing discomforting conclusions about the significance of human existence from the obscure and ancient otherness of worms.

Darwin, concluding the Expression also quoted, just as Hamley had done, from Hamlet, but used the Bard to make a rather different point:

Is it not monstrous that this player here,
But in a fiction, in a dream of passion,
Could force his soul so to his own conceit
That from her working, all his visage wann’d;
Tears in his eyes, distraction in’s aspect,
A broken voice, and his whole function suiting
With forms to his conceit? And all for nothing!

4.5 Mental states, and the minds of dogs

In the *Descent*, Darwin granted that many nonhuman animals expressed behaviours demonstrating the existence of what we would now term “mental states”. He thought this was often in an incipient form, but sometimes, “in well-developed” condition (2004, 151). He included the experiences of happiness, misery, grief, and rage. He also argued for more complex and subtle expressions: he allowed that some animals expressed jealousy, shame, or scorn. They could be magnanimous. They felt ennui, excitement, wonder, and suspicion. Dogs had a sense of humour, and could express “something very like modesty” (2004, 92). However, “no animal is self-conscious [if what is meant by this term is] that he reflects on such points, as whence he comes from or whither he will go, or what is life and death” (105).

Divergent ways of thinking about the implications of common ancestry and the evolution of mind would later harden into positions frequently characterised, respectively, as “anthropomorphism” and “anthropodenial” (Sober 2005). Depending on which position one takes, the other is generally seen as a corresponding error: a failure to take the correct perspective. So-called anthropomorphism (attributing the mental characteristics and emotional states of humans to nonhuman animals) is often criticised as sentimental, lacking in critical distance and wanting for scientific rigour. What Frans de Waal (1999) has, on the other hand, dubbed “anthropodenial” is claimed to stem from an opposite error: an overly tough-minded scientific scepticism that would reject even common-sense talk of mind and emotion in animals, and disallow such
intuitively appealing claims as ‘your pet dog experiences sadness’ (Sober 2005, 86; Griffin 2001). Donald Griffin (2001) has observed that scientists often come down on the latter side, and Sober also thinks there is an asymmetrical attitude to these two perspectives. He believes that philosophers and biologists have tended to be more critical of the supposed sin of anthropomorphism than they are of anthropodenial, perhaps due to “a more general pattern in scientific culture in which tough-mindedness is valued” (86).

More recently, some have argued for a middle path. The “behaviourist or mentalistic” dichotomy, they say, is a false and misleading one, characterised at the extremes of both sides by implausible hypotheses and straw man arguments (Penn and Povinelli 2013). Penn and Povinelli think that strict behavioural hypotheses, which insist that we are not generally entitled to interpret animal behaviours as evidence of their ability to reason in an inferentially coherent fashion, are no longer tenable. But they also question whether anyone “really” in fact holds the supposed view that animals can only respond to stimuli and are incapable of any representational thought about past, future or states of affairs. They also believe, contra some theorists at the other end of the spectrum, that it is legitimate to talk about a discontinuity between human and nonhuman minds. Animals can reason about the world in a rich and inferentially coherent fashion, but this does not necessarily mean they reason about unobservable or hypothetical states.

But if we fastidiously avoid crude and unreflective anthropomorphism, and refuse the easy slide into intuitive claims and arguments from anecdote, observation and common-sense that closely-related species must be basically “like us” psychologically, do we run the risk of replacing this bias with another bias, closing ourselves off to important signals that might indicate how many nonhuman organisms are indeed “like us” in certain important respects (Sober 2005)? Daniel Dennett has recently suggested that the answer lies somewhere in the middle between the “romantics”—perhaps too quick to see humanlike traits...
in animals—and the “killjoys”, with their ostentatiously parsimonious explanations.\textsuperscript{19}

Descartes is commonly held to provide the paradigm example of the scientific attitude at its most anthropocentric and extreme. (While Descartes’s conception of animals as “automata” is notorious and often despised, whether he should be interpreted as denying that animals have feeling at all has been questioned by Cottingham [1978]). But this tendency for philosophers and thinkers to gravitate to the one attitude or the other, to an intuitive/“romantic”, or a scientific/killjoy” perspective on animals could also be identified in divergent nineteenth-century readings about the implications of common ancestry.

The Darwinian biologist George Romanes came down firmly on the side of granting that animals have what we might call mental states (Romanes 1882). Anticipating likely criticisms of this view, he took pains in his introduction to Animal Intelligence to argue that he was approaching the question scientifically, and from the express perspective of Darwin’s theory of descent—recognising that past reliance on unsubstantiated claims, speculation and what he called “a mere love of anecdote” had been an historical weakness in discussions about emotion and general intellectual ability in animals (Romanes 1882, vii). Nonetheless, Romanes did himself make liberal use of observational reports and anecdote, and, like Darwin, freely applied the common terms of human psychological life, behaviour and mental experience to many different species, writing of the “courage” of spiders (205), the “pride” of birds (279) and the “cautious sagacity” of wasps (192), while the frigate pelican, “a professional thief”, would “commit highway robbery in the air” (284). Romanes, drawing on a second-hand observation, thought there was “no question” that a parrot could recognise itself in a mirror (310).

\textsuperscript{19} Dennett is quoted here from an article published in Science, March 2 2012, vol. 335, interviewed at a Royal Society meeting on animal cognition. (“Killjoys challenge claims of clever animals”)
Romanes, seeking to advance the Darwinian case for the continuity of mind, was careful to circumscribe his use of notoriously pliable and woolly terms like instinct, reason and intelligence. He also laid down criteria to judge whether a creature might be held to have “mind” at all—boiled down, having a mind required both consciousness and an ability to exercise choice in at least some actions (R. Richards 1987). On the other hand, Romanes gave no particular definition of “emotion” and “volition” beyond remarking that he used these terms in their “ordinary psychological” signification (8), but in fact, going on to apply the idea of “emotional life” very broadly—to encompass sexual, predatory and maternal behaviours in spiders, for example (Romanes 1882, 204). Yet Romanes, and others who shared his general views, still found these ideas rebuffed or treated with scepticism (King and Viney 1992). In the Preface to Animal Intelligence, Romanes complained that he was on the back foot, because the question of whether animals have minds had for so long been treated simplistically and uncritically by “unscientific” authors that it was now considered by some unworthy of serious scientific investigation at all.

Conwy Lloyd Morgan—at one point a student of Huxley’s—was one who had cautioned against more naive, excessive or speculative claims about animals’ minds. He distilled this idea into a methodological principle that subsequently became famous as his ‘canon’: “In no case may we interpret an action as the outcome of the exercise of a higher psychical faculty, if it can be interpreted as the outcome of the exercise of one which stands lower in the psychological scale” (Morgan 1894, 53). This methodological caution subsequently acquired a keen edge, often interpreted as a methodological admonishment against the admission of mentality in animals per se. Richards notes this shows a lack of historical subtlety about Morgan’s evolutionary thought and the theoretical problems he was responding to (R. Richards 1977 and 1987). Kimler has argued that Morgan was actually making a pessimistic point about our access to neuropsychological states, not a plea for reductive parsimony: he wanted to preserve Darwin’s evolution of mentality without Romanes’s credulity. But “the fashion for
reductionist, mechanist, mind-denying psychology invoked his name for its parsimony and denial of intrusive, messy, inaccessible mentality” (859). For Sober, we cannot read Morgan’s canon as settling the question of “whether cladistic parsimony is a valid principle of evolutionary reasoning”. To avoid either unwarranted anthropomorphism, or unreasonable anthropodenial, we need not canons, but empiricism (Sober 2005, 96–7).

4.6 The moral rights of tigers

The empirical perspective loops us back, as so often, to Huxley, but also to another and more recent figure in the history of evolutionary naturalism. Famously, 116 years after the Origin E.O. Wilson, who shared with Darwin a fascination with the intricate social systems of ants, provocatively declared that it was time to consider the human species from the parsimonious perspective of a zoologist from another planet (E.O. Wilson [1975] 2000a). Huxley, too, had in Man’s Place urged readers to take a visiting Saturnian’s perspective, in order to appreciate the morphological obviousness of classifying humans in the same order as the great apes. Huxley thought that simply instructing students in the correct method of examining the structure of a single lobster would be sufficient to instill in them just such a zoological perspective and commitment to empiricism (Huxley 1860b).

Huxley was of course, by training a comparative anatomist, and like Darwin, explicitly endorsed the practice of vivisection as a necessary tool of empirical science, albeit with expressions of regret. During the 1880s and 1890s, Huxley addressed this matter of the relative interests of humans and animals with typical vigour, in several essays that had a very different take on the relationship between men, animals, the natural world and moral progress, to that of anti-cruelty crusaders like Colonel Hamley. These were ringing paens to evolutionary naturalism and humanistic aims of science, taking unapologetic aim at Victorian
sentimentalism. In ‘The Progress of Science’ (1887), Huxley made it clear where he stood:

Unless the fanaticism of philozoic sentiment overpowers the voice of philanthropy, and the love of dogs and cats supersedes that of one’s neighbor, the progress of experimental physiology and pathology will, indubitably in the course of time, place medicine and hygiene on a rational basis ... To one who has seen half a street swept clear of its children, or has lost his own by ... horrible pestilences, passing one’s offspring through the fires of Moloch seems humanity, compared with the proposal to deprive them of half their chances of health and life because of the discomfort to dogs and cats, rabbits and frogs, which may be involved in the search for means of guarding them (Huxley [1887] 2005, 123–4).

In ‘Natural and Political Rights’ (1890), Huxley wrote acerbically that were a tiger “to have an attack of the philozoic and vegetarian fanaticism which is going about, and to declare that he would neither kill, nor eat flesh, any more, he would undoubtedly undergo a lingering and painful death or starvation” [1890] 2005 351). The tiger, by this measure, gained in stature over the zoophiles: it acted in proper accord with its own place in nature. The tiger could not do otherwise.

In fact, if there is evidence of intention anywhere in the fabric of things, the study of the structure of one of the cats, great or small, will prove it to be a machine most admirably adapted to slay and tear to pieces other living quadrupeds; and will demonstrate that, if it was intended to do anything, it must have been intended to perform exactly that butcher’s work which it executes so well. ([1890b] 2005, 344–5)

The predaceous cats “in their capacity of butchering machines, have undergone a steady and slow gradual improvement, every step of which has been effected at the expense of an enormous total of suffering to the animals butchered” (345). Huxley used his own native weaponry, logic, to toy with some old enemies. Richard Owen had once argued that the curious attenuated finger of the aye-aye, a Madagascan lemur, was so fit for its specific natural purpose that the animal’s
structure was bound to suggest to the human mind the analogy of a machine, and so in turn impress on the sensitive human mind mysterious ‘secondary’ laws of nature by which species were supposed to have come into being (Owen 1863). There was no room for chance modification to be captured by advantage in Owen’s picture. By 1890, Huxley’s retort to this kind of thought—hardened by developments in the study of the nervous system and embryology—was that one surely construed the animal-machines as a sign of creative benevolence at the risk of one’s philosophy being exposed, by the ruthlessly-honed predatorial skills of the “machines” themselves, as decidedly naïve.

Nor was the tiger off the hook by this logic—for “if the tiger is entitled by the law of nature to use its claws and teeth and soft-footed stealthy cleverness for the purpose of his self-preservation, the man may employ his hands and the weapons that are so admirably adapted to fabricate and wield, and use his still greater cunning, in tracking and stalking tigers to the like end” (Huxley 2005, 348). But behind the game in this contemptuous cuff to “the creative hypothesis” was this familiar and relentless message: “the Law of Nature is not a command to do, or refrain from doing, anything” (349).

4.7 Huxley’s carnivores and Nature’s commands

In the later part of the nineteenth century, the American oil painter William Holbrook Beard made a distinctive statement using Darwinian themes of ancestry, painting a series of garish and bizarre fantasies that blurred the boundaries between humans, “savages” and wild animals (humans-as-bears were one favoured theme). In ‘Scientists at Work’ (1864), finely-dressed monkey-gentlemen with pronounced simian jaws cluster in a drawing room, poring over books, while one looks on at the scene with distant and affected intellectual nonchalance. In ‘The Discovery of Adam’ (1891) primate gentlemen prod and peer (one through a monocle) at strange amphibious ancestor. In the background of this painting, a winged reptile does primitive pas-de-deux with a kindred beast. In
Beard’s brooding and dark ‘The Power of Death’ (1889-90) the figure of Death, leering under an apocalyptic sky, is portrayed with the body of an elephant at his feet, and a felled lion behind him. A second great carnivore, a tiger, fanged mouth wide in mortal fear and terrible claws powerlessly unsheathed, fails to escape the bone-fingered grasp of the ultimate predator. Death, the final leveler, slays the butchering machine. The rime of a weary, blood red sun, the only witness to this sombre scene, crusts the horizon. It is an arresting, nightmare-like image, with a jarring and allegorical character.

Carnivorous animals are a recurrent motif in Huxley’s essays on evolution, morality, and ethics. Huxley’s carnivores were seized upon by the radical exiled Russian aristocrat, Peter Kropotkin, in a series of essays published in the periodical *The Nineteenth Century* during the 1890s, and later collected as a book,
Mutual Aid: A Factor of Evolution (1902), which criticised Huxley’s discussion of the moral aspect of nature in an 1888 essay, ‘The Struggle for Existence in Human Society’ (Huxley [1888] 1895). In his Nineteenth Century essays, the Russian naturalist argued that Darwin, but more particularly, Huxley, had over-emphasised the struggle between individual organisms in their representations of the evolutionary process. Kropotkin’s claim was that, intent on showing the importance of natural selection and under the distorting influence of Malthus, Darwin had downplayed the evolutionary significance of sociality and cooperation, particularly cooperation within species. Numberless “followers of Darwin”, Kropotkin suggested, had then “made modern literature sound with the war cry woe to the vanquished” and come to “conceive of the natural world as a world of half-starved individuals thirsting for one another’s blood” (Kropotkin 1890a, 338). Huxley was singled out as a supposed key populariser of this conception of nature.

Kropotkin carried this argument with Huxley throughout his life. (He died in 1921, some 26 years after Huxley). Kropotkin was an anarchist and political radical, while Huxley, hardly a socialist, defended the institution of the liberal state on explicitly ethical grounds. So this was, in an important way, a difference of political perspective, as much as it was of their conceptions of the evolutionary process. Kropotkin explicitly linked his interpretation of Darwin to his political anarchism, enlisting evolutionary theory in support of his political philosophy by suggesting that it was mutuality and cooperation which had driven human evolution, and that peaceful and cooperative anarchistic communities would be the natural state to which human organisation would tend, if their social interactions were not distorted and corrupted by the unnatural political form of the state (Kropotkin [1901] 1912). Historians including Hale (2014) and Kinna (1992) have also emphasised their respective attitudes to Malthus as a key figure in understanding Kropotkin’s disagreement with Huxley over Darwin. But while these political and Malthusian readings no doubt accurately reflect important aspects of their differences over Darwin, I believe they are also inadequate, in an
important respect: that they tend to overlook a more fundamental philosophical difference.

I here consider that the differences between Huxley and Kropotkin run to their fundamentally different beliefs about the moral state of nature, and their alternative readings of nature’s moral “message” for human ethics and social organisation. I will argue that is, in essence, a difference in personal moral intuition, rather than a simple dispute about interpretations of a body of facts or a theory. Such disagreements, coming to rest on abstract qualities like the value or significance of particular consideration, are hard to resolve (Kahane 2011, 108). Their attitudes to Malthus and their respective political construals of the implications of evolutionary descent with modification are symptomatic of this more profound philosophical difference, rather than its cause.

The emotionally and poetically charged ‘Struggle for Existence in Human Society’ was the catalyst for Kropotkin’s first published criticisms of Huxley. Huxley’s essay inspired him to set out his theory that it was mutual aid and sociality between communities of species, not individual competition or rampant bloodlust, which was the key to correctly understanding the moral implications of the evolutionary process (Kropotkin 1890a, 1890b and 1891).

‘The Struggle for Existence’ was certainly a strident, unapologetic and forceful expression of Huxley’s evolutionary naturalism, and of his view about its wider ethical implications. Commentators often highlight that Huxley wrote this essay at a time of intense personal anguish following the death of his daughter Mady (Desmond 1997, de Waal 2006, Hale 2014). They also highlight the bloody political volatility in England during this time. It was this social context that led Michael Helfand (1977) to home in on the narrow conclusion that Huxley’s essay was motivated by his anti-radicalism. I urge a much broader reading, which focuses on the centrality of the essay’s theme of suffering.
Huxley's central philosophical thesis in this essay is that suffering is an inevitable condition of existence, and society's great moral challenges can only be met by accepting this. From this thesis, all his claims about ethics and politics flow. That suffering is key into reading this essay is suggested by crucial clues in the way Huxley employs his principal carnivore, the wolf—an animal that plays a starring role in the work. Huxley begins with the observation that is commonplace, when a wolf slays a deer, for the deer to engage our human moral sympathy. We are moved by the fact of the gentle deer's suffering, because it appears innocent and undeserving of its violent fate. But Huxley proposes to his readers that they should consider the following proposition about the relationship between nature's hunters and hunted:

Viewed under the dry light of science, deer and wolf are alike admirable; and, if both were non-sentient automata, there would be nothing to qualify our admiration of the action of the one or the other. (Huxley [1888] 1895, 197)

Of course, the deer is not non-sentient. It suffers when it is preyed upon. But the wolf is likewise sentient, and it will suffer cruel deprivation, perhaps starving, if denied its prey. If we impartially judge the matter, and see both animals as the product of a contingent nature indifferent to its suffering products—in other words, if we see that they both act from necessity—we must conclude that there is no rational basis for moral condemnation of the wolf for inflicting suffering on the deer.

For the carnivores, however brutal and sanguinary, have only done that which if there is any evidence of contrivance in the world, they were expressly constructed to do. (198)

Note that this is no generalised scientific claim that nature is a parade of rapacious flesh-eaters. Rather, it is a philosophical point: an appeal to the reader to recognise that all things in nature suffer—including those creatures that do not initially engage our intuitive human sympathies. All things are impelled by
their nature and desires, and all living things may find those desires frustrated as they come up against the brute facts of competing interests in the natural world—they are out-run by their prey, perhaps, and so must go hungry or even starve. Thus, Huxley employs his natural predator and its victim in a very particular way: he examines them using the terms of the logical structure of (human) ethical arguments, to call into question the basis for a common (human) moral intuition.

‘The Struggle for Existence’ was Huxley’s most strongly worded plea for readers to examine the implications of a naturalistic worldview impartially. The “optimistic dogma that this is the best of all possible worlds”, he thought, was to anyone who had observed nature honestly, “a libel upon possibility” (196). Yet to claim it was the worst of possible worlds was “mere petulant nonsense” (201). This was no adjudication on morality of the natural world. It was an ethical claim—that is to say, only meaningful from a human point of view. It would be as senseless to think of nature as essentially moral or immoral as it would be to condemn the wolf. Nature as such is outside of the realm of moral statements (the theme to which Huxley would return in ‘Evolution and Ethics’). That things suffer is a universal fact—but suffering is a subjective problem for the living things that experience it, not a metaphysical judgement meted out by the nature that produced them. One had no need to descend to Hell to hear the ‘sighs, complaints, loud wailings’ of the grief of living things (200), Huxley wrote, quoting Dante (whose works had accompanied him on the Rattlesnake). 20 There was plenty of grief on earth. But it was vain to try to invent a moral purpose or rational justification for this suffering. The essay therefore had a familiar Huxley target: a priori speculators. Of speculators of the theological sort, Huxley had only scorn.

Having created God in their own image [they] find no difficulty in assuming that the almighty must have been actuated by the same motives as

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20 The quote, which I give here in translation, and which Huxley quotes in the Italian, is from Dante’s Inferno: “Sospiri, pianti, e alti guai”.

themselves. They are quite sure that, had any other course been practicable, He would no more have made infinite suffering a necessary ingredient of His handiwork than a respectable philosopher would have done the like. (196)

Also under fire, however, was the agnostic Spencer’s evolutionary political philosophy, along with other species of Utopianism from socialism to the social Darwinist polity of the pigeon fanciers. Huxley’s point was that the flawed liberal state was probably about as good as might be achieved, given the objective facts about human nature, and of the world from which human nature evolved. It was “an error” to imagine evolution signifying any constant tendency to increased perfection. Retrogressive was “just as practicable” as progressive metamorphosis. Protococcus, rather than men or carnivorous wolves, was the likely heir to the earth (199).

There were relatively few “brutal and sanguinary” carnivores in Kropotkin’s natural world. The editor of The Nineteenth Century, Sir James Knowles, told Huxley—perhaps rather pointedly—that the richly social and cooperative natural world Kropotkin described in Mutual Aid in Animals (Kropotkin 1890a) was “one of the most refreshing” takes on nature he had come across (quoted in Desmond, 1997 p. 182). Animals acting in predatory isolation were an exception in nature, according to Kropotkin (1890a and 1890b). There was an overwhelming preponderance of cooperative and social species, compared to “those few carnivores who do not associate” (1890b 702), and even among carnivores, “we can only name the cat tribe” as “decidedly” preferring “isolation” (703). Animals, and in particular the mammals “at the very top of the animal world” and most like man in structure and intelligence were “eminently sociable” (1890b 708)—and one of the chief benefits of this evolved sociality was, in fact, to reduce suffering.

Alfred Russel Wallace (Wallace 1889) was another who responded to Huxley’s essay by questioning the scientific legitimacy of Huxley’s emphasis on struggle and suffering. This was, as Kropotkin had done, to rebut Huxley’s philosophical
argument as though it was intended as scientific naturalist’s account of the world. Wallace would suggest that Huxley had “greatly exaggerated” the “torments’ and ‘miseries’ of animals”, and supposed this alleged suffering throughout nature “to have little real existence” in fact. For one thing, according to Wallace, animals were spared the pain that humans suffered in death—a pain, he wrote, “far greater, in most cases, than in the reality” (Wallace 1889, 37).

Wallace also argued that the far greater proportion of the lives of most animals was pleasurable. He even doubted that violent deaths necessarily cause pain, suggesting that “when death follows after any great shock it is as easy and painless a death as possible” (38). As evidence for his case, he appealed to none other than Darwin himself.

In the *Origin*, Darwin had insisted that he used the term “struggle for existence” in a “large and metaphorical sense” (Darwin 1859, 62). Yet while Darwin soothed that “the war of nature is not incessant … no fear is felt … death is generally prompt” (79), it was difficult to escape his bleaker point that all living organisms, from Scotch firs to water beetles, from dandelions to the taloned tiger, live “by a struggle at some period … heavy destruction inevitably falls either on the young or old, during each generation or at recurrent intervals” (66). Moreover, this was a struggle not just with external forces (like droughts or predators), but occurred within and between the members of species and communities of animals, as they competed to eat or reproduce. Many readers of the *Origin* were therefore in no doubt that from Darwin’s perspective, struggle, and by logical extension, suffering, were the condition for the possibility of evolutionary change at all.

The carnivores are certainly rampant in a number of Huxley’s essays. But they are not intended as literal descriptions of nature, but rather, function as symbolic figures. In ‘Evolution and Ethics’ he would write:

> For his successful progress, throughout the savage state, man has been largely indebted to those qualities which he shares with the ape and the tiger; his exceptional physical organization; his cunning, *his sociability*, his curiosity,
and his imitativeness; his ruthless and ferocious destructiveness when his anger is roused by opposition. (Huxley 2009a, 51–2, my italics)

But he added:

... civilized man brands all these ape and tiger promptings with the name of sins; he punishes many of the acts which flow from them as crimes; and, in extreme cases, he does his best to put an end to the survival of the fittest of former days by axe and rope (52).

Note the nod to the sociability of both tiger and ape. Huxley’s wolves, his “ape and tiger promptings” were used in his literary essays as the symbolic moral lesson in Huxley’s evolutionary naturalism: that the ways of the cosmos are also in the breast and in the psychology of even the most reasonable and ethically developed of civilised men. They are metaphors for that which the human art of practical ethics, in its proper sphere, is to tame and circumscribe, its path lit by the candle of scientific knowledge.

4.8 The message from Malthus

Kropotkin argued that Darwin had considered social cooperation between animals “more permanently at work” in the evolutionary process than the instinct for individual self-preservation. Mutual aid between animals of the same species in nature, Kropotkin said, was immensely important for “the preservation of both the animal species and the human race, and still more so for their progressive evolution” (Kropotkin 1992, 14, my italics). Selection, in fact, favoured the avoidance of competition because this tendency would ultimately “guarantee existence and progress, bodily, intellectual and moral” (Kropotkin 1890b, 718). This idea would become central to his efforts to depict political anarchism as a scientific project founded on an organic morality of nature. Late in his life, in Ethics: Origin and Development (published in 1924) Kropotkin suggested that by supposedly separating the ethical self from our evolved nature, Huxley had effectively affirmed that morality must be supernatural. He repeated the charge
that nature was represented by Darwinists as a battlefield, arguing that there was no way, without contradiction, that one could simultaneously maintain both that “evil was the only lesson which man could get from nature” and “the good principle will be triumphant” (12). This demonstrates Huxley’s and Kropotkin’s fundamentally irreconcilable conclusions about the implications of Darwin’s account of common descent for human ethics, psychology and epistemology.

The differences were likewise about more than the role or influence of Thomas Malthus in Darwin’s evolutionary writings. Daniel Todes (1987, 1989) has argued that nineteenth-century Russian intellectual hostility to Malthus was a stimulus for Kropotkin’s developing understanding of biology, and that his theory of a cooperative nature founded on the principles of sociality and mutual aid was fired by his hostility to and rejection of Malthusianism. Piers Hale (2014) has also explored this “Malthus or mutualism?” angle in his study of Huxley and Kropotkin. Malthus’s Essay on the Principle of Population (1798) had argued that populations will always tend to increase beyond the means of their subsistence. To prevent the human population growing beyond the capacity of resources to support it, Malthus had suggested that social policy ought to “facilitate, instead of foolishly [impeding], the operations of nature in producing ... mortality” (Malthus 1992, 266), a grim warning that had sounded calamitously across the seething and crowded industrial cities of nineteenth-century England. Malthus’s argument also famously suggested to Darwin that a key factor in natural selection was the struggle between organisms over limited resources.

There is no doubt that Huxley attributed much suffering to a universal struggle for existence, and that he accepted the Malthusian argument that living things must struggle bitterly for scarce resources. Huxley did not dispute that parsimonious Nature prefers to put the sick or ailing man in his coffin rather than cure him. But “judged by an ethical standard, nothing can be less satisfactory” (Huxley 1888, 211). The second part of ‘The Struggle for Existence in Human Society’ is therefore a polemic against the Spencerian idea that
administrative and political interference in the operation of the social body politic could harm future evolutionary progress (Spencer 1884). Far from staying out of the affairs of men and letting the most naturally advantaged prevail, in the vogue of Spencer, the State must, said Huxley, intervene to educate, support and develop the productive powers of its population broadly, in order to secure at least “a fair amount” of physical and moral welfare (217). Huxley wrote that an economically competitive society where labour was insufficiently remunerated and the great mass of men and women were uneducated would surely not evolve into some progressive social Utopia of the morally and constitutionally most robust, but rather, degenerate into “hideous misery and degradation ... utter ruin” (219). For Huxley, the social fabric was strengthened only with the weave of social agreement, which meant that the individual might well be required to forgo his own interests for the good of the social polity. Nature evolved to no moral end—but “its perfection, social life”, was morality embodied (205).

4.9 ‘With respect to these barbarians’

Kropotkin drew on bees, termites, white tailed eagles and kites, crabs and the social cetaceans among his examples of social species, but it was human societies that he thought provided the crucial link between Darwin’s evolutionary ideas and his anarchist political philosophy. In ‘Mutual Aid among Savages’ (1891), Kropotkin wrote that Huxley had “represented primitive men as ... tigers or lions, deprived of all ethical conceptions” (Kropotkin 1891, 539). But Kropotkin argued that ethnology had come to “what might have been foreseen by the zoologists.”

None of the higher mammals, save a few carnivores and a few undoubtedly decaying species of apes (orang-outangs or gorillas), live in small families ... isolatedly struggling ... the band, not the family, was the earliest form of social life. (540)

He amassed evidence for a view of history that emphasised the centrality of sociality to human evolution: the Hottentots might have been described by
Lubbock as “the filthiest animals—and filthy they really are” (Kropotkin 1891, 545), but “those who know them highly praised their sociability and readiness to aid each other” (545). In Mutual Aid (1902), the Fuegians, made famous by the voyager Darwin, lived “peacefully” together, which was not exactly as Darwin had depicted it (642). The Tungus Kropotkin had befriended in his Eurasian travels could not, he wrote, be made to understand “our civilisation of individualism” (554). Inuit life was “based upon communism”. There were, of course, more confronting aspects to these societies, troubling to the European mind as they had certainly been for Darwin. These included infanticide, the abandonment of the elderly, the rules of blood-revenge, and even cannibalism. These things Kropotkin interpreted as occurring only “under the sheer pressure of necessity” (552), and crucially, in a context of group sociality that in fact provided these behaviours a moral and ethical framework that some European travellers had so often found wanting. Measures for diminishing the birthrate were, according to Kropotkin, employed only until clans succeeded increasing their means of subsistence, whence they abandoned the practice of infanticide. He added this fairly aimed political barb to the supposedly civilised Europeans: they would on the one hand, tar “savages” as immoral or evil, yet “live within a stone’s throw from dens in which children die from sheer want of food” (105). Kropotkin’s message was that Darwin had been correct to see man’s social qualities as the key to his evolution, but had missed the full significance of his own observation. And Kropotkin had a message for Huxley too: if Rousseau had idealised the savage “in the state of nature” (557), the pendulum had swung too far. Scientists anxious to prove the animal origin of man had exaggerated the bestiality of the “savage”.

Huxley’s, Darwin’s and Kropotkin’s encounters with indigenous people had shaped their respective thoughts about the processes of human evolution. But it is equally revealing what their own perspectives seem to have brought to those encounters. In Darwin’s encounters with the indigenous people of Tierra del Fuego, what impressed him was the relationship between the extremity of their

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21 Obsolete term for the Ewenki of Northern Asia.
physical environment and the poverty of its resources, and what he saw as the impoverishment of their culture. In warm, fertile Brazil, Darwin had been much impressed by the masculine strength and vivacity of the knife-carrying Gauchos: he found them hospitable, handsome and proud. The men, women and children of St Jago, in the Cape de Verde archipelago were “merry”, and “I never saw anything more intelligent than the Negros ... [the children] examine every thing with the liveliest intention” (Beagle Diary January 20 1832, p. 26). But the dress and appearance of the Fuegians was, the English voyager wrote, “miserable, their manner of living ... still moreso” (Beagle Diary, December 18 1832, p. 124).

Darwin thought that “if the world was searched, no lower grade of man could be found. – the Southsea Islanders are civilized compared to them, & the Esquimaux, in subterranean huts may enjoy some of the comforts of life” (I25). If it is “a common subject of conjecture what pleasure in life some of the less gifted animals can enjoy”, yet “how much more reasonably the same question may be asked with respect to these barbarians” who “sleep on the ground coiled up like animals” (Darwin 1845, 213).

In Australia, Darwin found the Aboriginal people west of Bathurst to be “far from” the “degraded” beings he had been led to believe from common representation (Beagle Diary, January 16, 1836, p. 398). Although he remarked that they did not cultivate the land, nor “take the trouble” of keeping sheep or building houses, he judged them “some few degrees higher in civilization, or more correctly a few lower in barbarism, than the Fuegians” (398).

By the time Darwin wrote the Descent, he had come to theorise that the fate of indigenous people, particularly those in resource-poor environments (where, thought Darwin, they might be analogously closer to “the lower animals”) was tied closely to “lessened fertility” arising from changed conditions or habits of their life when they came into encounter with civilised cultures (Darwin 2004, 218). Indeed, the Descent even supposed that it was lessened fertility, rather than
the effects of introduced disease or colonial warfare (which he did not deny to be agents of the process), which had the greatest impact on the extinction of races.

Huxley recorded his *Rattlesnake* encounters with the indigenous people of northern Australia and New Guinea with an unabashed and uncensored mix of astonishment, admiration, fascination and occasionally, frank horror. On a scruffy coastal Queensland riverbank, “we fell in with a party of natives who immediately rushed off in great affright. They had an unfortunate child diseased in some manner so that it could only crawl on all fours. It appeared at first not to be aware of the cause of the sudden departure of its friends but suddenly perceiving us it set up a series of the most unearthly yells and scuttled off as fast as it could get along” (*Rattlesnake Diary*, n.d. June 1848, p. 131).

His encounters did not yield the influential anthropological or theoretical fruits of Darwin’s, but as Julian Huxley, the (somewhat intrusive) editor of his diaries remarks, these intimate experiences did influence his grandfather’s later ethnographical work, and without doubt, his sense of man’s place in nature. Huxley was particularly fascinated with the technologies he encountered: boats, tools, and implements were all examined, candidly remarked upon and their ingenuity admired. He wrote of cooking vessels, canoes, headwear and everyday objects. In New Guinea, the crew of the *Rattlesnake* bartered heartily with “niggers” ornamented with “memorials of friends or trophies of vanished foes” — one had “a human jaw by way of a bracelet” (*Rattlesnake Diary*, June 24 1848, p. 191).

He could also admire what he took to be their freedom from theistic and metaphysical burdens and cares.

They must have a considerable mechanical turn, for besides their carving, and the careful way in which the large beams of the catamarans are adzed flat on their upper surface, they make admirable ropes. And they have several varieties of musical instruments—drums of various sizes, hollow bamboos
through which they roar and bellow, pans-pipes of seven reeds, and a kind of large Jew’s harp. The people seem happy, the means of subsistence are abundant, the air warm and balmy, they are untroubled with the ‘malady of thought’, and so far as I see civilization as we call it would be rather a curse than a blessing to them. I could little admire the “Stigginses” of Exeter Hall, who would send missionaries to these men to tell them that they will all infallibly be damned. (August 22, p. 224)

Free from the burdens of “civilization” they well might be—but Huxley was, and would never be, in any doubt that it was “civilization” that counted in the final reckoning, and this whimsical youthful encounter with “untroubled” life in a remote corner of the world, it did not change his later scientific adjudication that the “highest places” in civilisation’s hierarchy were not in reach of our “dusky cousins” (Huxley 1865, 66).

If Darwin’s idea of indigenous people had been closely tied to his perceptions of their relationship to nature, climate and resources, and Huxley’s were to his fascination with the artifacts by which nature might be tamed for human ends, Kropotkin formed from his travels a story that emphasised the naturalness of sociality and structures of mutual aid and support—even when those social conventions might not seem, to European eyes, obviously virtuous.

4.10 Darwin, anarchism and the state

Kropotkin increasingly focused on this political message in his theory of mutual aid, which he linked explicitly to Darwin’s theory of evolutionary common ancestry. He wanted an objective social science to underpin the anarchist principles of social organisation. Anarchism was “the creative constructive force of the masses, [elaborating] common-law institutions ... to defend themselves against a domineering minority” (Kropotkin [1901] 1912, 16). Aided by modern science, the goal of anarchism was “to set up institutions that are indispensable to the free development of society, in opposition to those who put their faith in [State] laws” (16).
Kropotkin therefore needed to show that this anarchist vision of a cooperative social order, organically formed against the unnatural and corrupting institution of the state, had its basis in a cooperative and social nature. He had to demonstrate that the values of socialisation and cooperation were not ‘good’ because they were authorised by ‘god’ or by an abstraction like Kant’s categorical imperative, but because they were natural.

What *Mutual Aid* had hinted at, Kropotkin made more explicit in *Modern Science and Anarchism* (1901), published in English in 1912. Anarchism was “a conception of the universe based on the mechanical interpretation of phenomena, which comprises the whole of Nature, including the life of human sciences and their economic, political and moral problems” ([1912] 1995, 51). Darwin’s naturalistic theory of the development of the social sentiments was indispensable to Kropotkin’s political project. The chapters in the *Descent* that located the origins of human morality in the sociable instincts of animals became, for Kropotkin, the authentic Darwin.22 Darwin offered Kropotkin a naturalistic explanation for moral duty. Kropotkin had pursued this link in *Anarchist Morality* (1897), arguing there was no accounting for moral sentiment “so long as [we] believe it a privilege of human nature” (1897, 81).

“The ant, the bird, the marmot, the savage, have read neither Kant nor the fathers of the Church nor even Moses. And yet all have the same idea of good and evil. What is considered good among ants, marmots, and Christian or atheist moralists is that which is useful for the preservation of the race” (1897, 91, my italics).

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22 In the early twentieth century, under challenge from Weismann’s germ plasm theory, Kropotkin emphasised that Darwin had doubted the adequacy of natural selection alone as an explanation of evolutionary change, and begun to “assign more and more importance to the direct action of surroundings” (Kropotkin 1995, 139; 1919). The reluctance of biologists to recognise the importance of “sympathetic feeling and sociability” in evolution was, he continued to argue, due to Darwin’s popularisers emphasising the “Malthusian struggle for life”.
In reality, the *Descent* revealed a perspective in Darwin’s thought that was not so compatible with Kropotkin’s enterprise. Darwin had, as is well known, shown himself sympathetic to what appear to modern eyes to be some ethically troubling arguments that linked biology directly with politics in a rather different way than that which Kropotkin had in mind. The Manchester industrialist William Greg had argued in an 1868 essay in *Fraser’s* magazine that well-intentioned socially progressive policies might have the unintended consequence of suspending the actions of natural selection by “keeping alive those who, in a more natural and less advanced state, would have died, and better have been left to die” (Greg, 1868). Pondering the desirability of this outcome, Greg thought one might “conceive of a republic” in which “paupers” should be forbidden to “propagate” and prospective parents might be subjected to examination to determine their suitability to breed.

Darwin himself could certainly “conceive” of such a republic, and he danced around the edges of Greg’s essay in the *Descent*. The conclusion Darwin recorded was that society must bear “the undoubtedly bad effects of the weak surviving” (2004, 159) rather than check social sympathy and tenderness with harsh policies that would risk the “deterioration of the noblest part of our nature”. What is revealing is that he did not actually reject the basis for or substance of Greg’s argument, and it is clear that its grim counsel was never far from Darwin’s mind. Darwin could concur that early marriage of “the poor and the reckless” might present an “obstacle” to “an increase in the number of men from a superior class” (Darwin 2004, 163). He had not come to his conclusions about the social importance of bearing this cost via any convictions about *natural* equality.

Huxley, in 1890, also fulminated against Rousseau for his idealism in claiming men to be naturally free, and naturally equal (Huxley, 1890c). All the evidence, for Huxley, pointed to natural *inequalities* between men: in temperament, and intellectual and moral capacity. Like Kropotkin, he was an anti-idealist: both wanted a nature free of “the garb of superstition” (Kropotkin 1924, 3), and found
in Darwin’s evolutionary theory a means to reveal this. Metaphysics was “beaten” according to Kropotkin ([1912] 1995, 37). Psychology was the new site of contest.

Huxley saw science as the means to cure men of idealist error, lest they “follow it [into] the deepest of anarchic bogs”. Better to dispense with political ideals altogether than “adopt the first phantasm, bred of fallacious reasonings and ... the unscientific imagination, which presents itself” ([1890d 2005, 300–01]). Moral principles were not derivable from nature, but only by the agreement of men. Kropotkin had wedded the laws of nature to the science of anarchism in order to escape the trap (and the charge) of idealism and instantiate moral principles in nature.

Not only does Nature fail to give us a lesson of a-moralism, i.e., of the indifferent attitude to morality which needs to be combated by some extranatural influence, but we are bound to recognize that the very ideas of bad and good, and man’s abstractions concerning “the supreme good” have been borrowed from Nature. They are reflections in the mind of man of what he saw in animal life and in the course of his social life, and due to it these impressions were developed into general conceptions of right and wrong (Kropotkin [1924] 1992, 16).

Virtue and wickedness alike were not human artifice, but natural zoological categories. Kropotkin argued that in tracing the natural history of mutual cooperation throughout the animal world we would see the path to make it blossom in the human animal: we need look no further than our animality for our ethics. No state was needed, no dialectical method, no metaphysics—and above all, no “axe and rope” to quell ape or tiger promptings.

Anarchism is a conception of the Universe based on the mechanical interpretation of phenomena, which comprises the whole of Nature, including the life of human societies and their economic, political and moral problems. (1995, 51)
The key to interpreting the debate between Kropotkin and Huxley is whether or not ethical principles can be directly derived from natural laws. In other words, is there a true ‘science’ of ethics? Kropotkin argued—as Spencer had, although to different ends—that if nature is a lawful entity, then laws applicable for the proper organisation of human society must also be discernible from the study of nature. Huxley denied this move was proper, and defended his position with reference to his empirical and agnostic theory of knowledge, and the limits of human psychology. Darwin’s own views must be more indirectly gleaned. Darwin admitted the problem of ethics to be an obscure one, and indicated in the *Descent* that it would be difficult, if possible at all, to draw clear moral conclusions with reference only to the tenets of his theory. While he clearly had sympathy (sometimes only admitted with reluctance) for the idea that evolutionary common ancestry might have certain implications as to what might be needed for the “advancement” of mankind, he did not turn this, as Spencer and Kropotkin did, into a narrative of normative evolutionary ethics. Nor did he suggest that the fact of evolutionary common ancestry lent *prima facie* support to political radicalism. As we shall see in next chapter, however, there were other ways to claim the Darwinian theory of ancestry as evidence to support radical political agendas. Friedrich Engels would arrive at quite another view about what it meant to be the product of a natural process of descent with modification—and the condition of ‘being human’ was held to ultimately be quite different from that of ‘being animal’, Engels's appeal to Darwin notwithstanding.
CHAPTER 5:
WELDING EVOLUTION TO THE CAUSE OF REVOLUTION

5.1 Of bodies, mills and vapour engines

In this chapter, I will consider Engels’s incorporation of Darwin’s theory of common ancestry in his scientific philosophy of dialectical materialism, emphasising the anthropocentric direction in which he took Darwin’s evolutionary thought. It was not just in travelers’ tales of savages and gorillas, theories of transmutation, the sciences of embryological development and comparative physiology, or Darwin’s theory of common ancestry that the nineteenth century found an uncomfortable reminder of how narrow was the cusp of the human and the bestial. The century’s man-made mechanical bodies—mills and steam engines—would also serve as a brutal, grinding reminder of the fragility, the animality, and the mortality, of human bodies. In 1875, the Irish ornithologist and cleric Francis Orpen Morris produced a satirical pamphlet vehemently attacking the idea of a common ancestor for apes and men (Morris 1875). Dedicated to “the common sense of the people of England”, All the Articles of the Darwin Faith scorned the evidence proposed for evolution in the Origin and Descent of Man, but Huxley, the physicist John Tyndall and other prominent boosters for Darwinian naturalism were specifically in the clergyman’s sights. In this satire, a fictional Huxley is made to state his faith in “the hypothesis, that animals are mere machines, as much so as if they were mills and steam engines ... they do not hear, see or smell” (Morris 1875, 23).

In the early 1840s, Huxley was dissecting the dead of England’s poorest classes in the basement of Charing Cross hospital. During the same period, in Manchester, Friedrich Engels, the politically and philosophically radicalised son of a German industrialist, worked by day for the bourgeois interest in his father’s factory in the
‘Cottonopolis’, but by night immersed himself in the working-class world to bear witness to their living.

The upshot of that immersion, The Condition of the Working Class in England was published in German in 1845 (eventually published in English in 1891). In the noxious and malodorous English towns and cities, with their factories steaming like beasts in fields of smoky squalor, Engels found the lives of the English working class to be more than analogous with those of animals. With the coming of the steam-driven factories and spinning jennies, Engels wrote, the English working men and weavers of the eighteenth century who had led a “passably comfortable existence ... a righteous and peaceful life in all piety and probity ... for the most part, a strong well-built people” ([1891] 2009, 51) were progressively degraded, over a matter of mere decades, into a species—the “industrial proletariat”—whose physical, intellectual and moral state was worse than that of the animals with which they shared barns for beds.

For Engels, the abasement of working people in London, Manchester and the industrial towns of Lancashire and northern England was literally dehumanising. Old men lived in stables, families in “cattle-sheds for human beings” (Engels 2009, 90). Workers were “penned in” like domestic beasts, their children “swarming” about “as filthy as the swine that thrive upon the garbage heaps” (98). Whole families slept, like litters of puppies or of pigs, ten to a room. Everywhere, there was bodily refuse. For Engels, these conditions eroded the humanity of not only the poor. In London, Engels felt that the price paid for that wonder of civilisation was the loss of the humanity of all Londoners. They were no longer human beings in community, but isolated private interests, “monads” in a “world of atoms” (69). The nation held up as the pinnacle of civilised values had become inured to the “turmoil” of its streets, in which Engels found “something repulsive, something against which human nature rebels” (68).
Later, as we shall see, Engels would weave into his polemics against capitalism the same idea (this time giving it a Darwinian inflection)—claiming that the very nature of the capitalist mode of production was to reduce everyone, including the capitalists themselves, to the rude animal condition of a ceaseless struggle for existence. In the 1840s, however, no theory of transmutation had been needed for Engels to notice how close, in reality, the lives of men could be to those of the beasts. Describing the fetid slums around the Oxford Road in Manchester, Engels wrote:

The race that lives in these ruinous cottages, behind broken windows, mended with oilskin, sprung doors, and rotten door-posts, or in dark, wet cellars, in measureless filth and stench ... this race must really have reached the lowest stage of humanity (98).

Engels’s study of the working classes was more than an emotional journalistic appeal. It was a compelling piece of propaganda—delivered through the sociological analysis of a crisis in the very structure of human community, wrought by the rapid replacement of human labour power with labouring machines that dramatically intensified their productive outputs. As “the power-loom has taken possession of one branch of hand-weaving after another” (2009, 160) so superseding multitudes of working people, industrial machinery had also taken its toll on the physical and social body of working people. Since industrial weaving processes require “no muscular strength, but only flexibility of finger” (164), women and children had not only been brought into the workforce in huge and unprecedented numbers, they had become the preferred source of industrial labour. This, too, was part of the pattern of physical and moral degradation wrought by the industrial shift. As Engels saw it, the century’s “much-praised civilization” had even “unsexed” men and women “in the most shameful way” (168). “Irritation of the whole nervous system, with general lassitude and enfeeblement of the entire frame” (172–3)—consequent on sleep deprivation among those working the machines that thundered incessantly day and night—had fostered among working women and children the “temptation to
drunkenness and unbridled sexual indulgence” (173), women bearing illegitimate children as cats might a litter.

Karl Marx, in *Capital* (1867), would also point out that industrial machinery, by dispensing with human muscular power had revolutionised not just the manufacture of textiles and goods. It had radically altered the weave of the social fabric, by employing women and children on a mass scale. Each member of the family unit, regardless of age or sex, could now be co-opted for the ends of the capitalist. But Marx pressed and pursued this point. He argued that in the capitalist system of production, the individual worker was transformed, becoming “part of a specialized machine” (1990, 547). The industrial system of production, wrote Marx, “converts the worker into a crippled monstrosity by furthering his particular skills as in a forcing-house, through the suppression of a whole world of productive drives and inclinations, just as in the states of La Plata, they butcher a whole beast for the sake of his hide or his tallow” (481).

Not only is the specialized work distributed among the different individuals, but the individual himself is divided up, and transformed into the automatic motor of a detail operation ... Unfitted by nature to make anything independently, the manufacturing worker develops his productive activity only as an appendage of that workshop. (481–2)

In Marx’s striking account of the factory, the energetic force directed through the living human being was transferred, expressing and spending itself not as a traditionally recognisable human life, but as the inhuman will of the manufacturing machine—which was now itself an “objective organism” (517) into which living human material was incorporated. This was by no means intended merely as a metaphor. The industrial machines as depicted by Marx in *Capital* actually possessed the qualities of organisms. Like organic bodies, they had a cycle of life and death, with a productive “active lifetime” (527) marked by a gradual physical decay and degeneration (wear and tear); and finally, by “what we might call a moral depreciation” (528)—defined by Marx as the loss of exchange-
value over time, because similar machinery could be more cheaply produced or better machines out-competed it. Thus, built into Marx’s story was a process with more than echoes of the Darwinian: the mechanical operations of capitalism as *evolving organism*—each individual within each species of machine living and dying, and the whole machine-body evolving over time, some whole species themselves becoming extinct, and all under the selective pressures of the ruthlessly competitive economic forces and punishing external environmental conditions in which the machines operated. The process itself even left a paleontological record. The “relics” of old instruments of human labour, like “fossil bones” (286), could provide evidence for the investigation of extinct economic formations.

Marx was not, of course, the first or the only one to see that machines might be legitimately considered to have a *life* of their own. The writer Samuel Butler, in a short cryptic satire, ‘Darwin Among the Machines’, published under the pseudonym Cellarius in the Christchurch *Press* in 1863, had the same sort of thought about these queer creatures of the industrial age.

[I]t appears to us that we are ourselves creating our own successors ... In the course of ages we shall find ourselves the inferior race. Inferior in power, inferior in that moral quality of self-control, we shall look up to them as the acme of all that the best and wisest man can ever dare to aim at. No evil passions, no jealousy, no avarice, no impure desires will disturb the serene might of those glorious creatures. Sin, shame, and sorrow will have no place among them. Their minds will be in a state of perpetual calm, the contentment of a spirit that knows no wants, is disturbed by no regrets (‘Cellarius’, Christchurch *Press*, 13 June 1863, p. 183).

A curious and sometimes misunderstood chapter in Butler’s satiric novel *Erewhon* (1872) expands on this engagement with the topical notion that machines might possess something legitimately considered a form of consciousness. Reflecting the scientific discussions of the day—in which thinkers including Huxley wrestled with the matter (or otherwise) of what consciousness
might be in a law-bound, Darwinised natural cosmos—the writer of a mysterious historical text in Butler’s fictional future world of ‘nowhere’ wonders, “Who can say that the vapour engine has not a kind of consciousness? Where does consciousness begin and where end? Who can draw the line?” (Butler 1985, 199).

Huxley himself, as Marx neared publication of the first volume of Capital, also had something to say about vapour engines and spinning jennies. He was not disposed to give them a life, poetic, satiric or otherwise, nor did he attach a Darwinian story of selection to them. But he did posit a particular place and role for utilitarian industrial technologies within his own narrative of the true goal of scientific knowledge. In ‘On the Advisableness of Improving Natural Knowledge’ (1866), Huxley advised readers of the Fortnightly Review that it was “very certain that for every victim slain by the plague, hundreds of mankind exist and find a fair share of happiness in the world by the aid of the spinning jenny” (Huxley [1866b] 2005, 29). But that was not as far as things went. For Huxley had found a deeper calling in the thirst for natural knowledge than the creation of the merely utilitarian “toys” (29) of industrial modernity. One could certainly sing the praises of the practical, productive, and civilising powers of these wonders of modern industry. Their “accidental” (29) value was not to be underestimated by Huxley, and he joined happily enough in that chorus. But surely, he pressed on, it was blind to take such a dim view of natural knowledge as to imagine it had no better an object than the utilitarian goal of furnishing men with the means to improve their material resources and increase their pleasure and gratification. Huxley now laid out his own view of greater moral prize inhering in the pursuit of natural knowledge. On this reading, mankind’s pursuit of the knowledge of nature became nothing less than a duty, but not merely because it was the means to create railways or improve sanitation. It was, according to Huxley, because from the time that “the reason of man first came face to face with the facts of Nature; when the savage first learned that the fingers of one hand are fewer than those of both; that it is shorter to cross a stream than to head it” (32)—once man had acquired this much knowledge, said Huxley, the outlines of future
mathematics, physics, moral, economic and political science, were already sketched in. Practical technologies—like money-spinning or “comfort-grinding” machines (30) of the age—produced indispensable advances. But the solution of practical problems paid dividends by yielding a more noble kind of knowledge. It paved the way for far-seers like Newton or Copernicus to turn these practical insights into grand revelations about the nature of the world itself. It was only by seeking this kind of knowledge—natural knowledge for its own sake—that man might be rewarded by finally coming face to face with the truth about his place in nature, and his relationship to the vast natural universe, the turning planets, the tumbling oceans, and all the organisms which existed in the cosmos. It was the means, in other words, by which man, the only animal endowed with the capacity to see himself in relation to the world, could now come to know himself too. The improver of natural knowledge of the Huxley sort was indeed a kind of secular crusader, as some have put it (Ruse 1997). He renounced superstitious “idols of wood and idols of stone”. But he also shattered into pieces the obscuring traditions of idealism, of theology, the relics of Scholasticism and cant, those “idols built up of books and traditions and fine-spun ecclesiastical cobwebs” (38). There was “but one kind of knowledge and but one method of acquiring it” (41). In Huxley’s scheme of scientific progress, machines were not an end in themselves, but an incidental means on the path towards a loftier goal.

As Huxley denounced old idols and summoned the new limits of nature, his gaze fixed on the “altar of the Unknown” (38), Marx, peering into the pulsing dark heart of the sleepless machines of capitalism, was thrilled and appalled by their seductive and dreadful power, and by what he there saw revealed about the very nature of man. The worker in the capitalist’s factory was a singular kind of animal, producing, even as produced by, the material conditions and under which it laboured. In the modern capitalist factory system, the automaton—the machine—had itself become a living thing. Those humans working the machines were now the machine’s “conscious organs”, coordinating with the “unconscious
organs” of this extended machine-body (Marx 1999, 544). In 1845, Engels had pointed to men so degraded in their living conditions that they lived as beasts. In the feedback loop of Marx’s technological nature laid out in *Capital*, men were not only animals. They were also machines, while the machines were also beasts. Each produced the other, and perpetuated the cycle in the literally brutalising process of the capitalist phase of historical development.

5.2 Engels and Marx, Darwin and myth

Both Marx and Engels were familiar with Huxley’s work and thought. They kept abreast of his lectures and writings, and occasionally remarked on him in their correspondence. They appreciated Huxley publically thrashing some common enemies like the positivist Comte, but they were irritated by his disavowals of materialism. Of Huxley’s ‘On the Physical Basis of Life’, for example, Marx complained to Engels:

In his latest speech in Edinburgh, in which Huxley again took a more materialist stand than in recent years, he opened up another loophole for himself. As long as we really observe and think, we can never escape materialism. But all this is reduced to the relationship between cause and effect, and ‘your great compatriot Hume’ has already proved that these categories have nothing in common with the things in themselves. (Marx to Engels, Letter 128, 12 December 1868, *MECW*, Vol. 43)

This was a complaint that Engels continued to prosecute in his own political writings. In *Ludwig Feuerbach and the End of Classical German Philosophy* (written in 1886 and published as a pamphlet in 1888) he would scorn agnosticism as “shamefaced way of surreptitiously accepting materialism, while denying it before the world” (*MECW* Vol. 26, 368).

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23 In this image, Marx draws ironically on the writings of Andrew Ure, Scottish author of the *Philosophy of Manufactures*: ‘the Pindar of the automatic factory’, in Marx’s acerbic words. Ure, as Marx goes on to comment, presents the machine not just as an automaton, but as an autocrat. In Ure’s own words: “The benignant power of steam summons around him his myriads of willing menials, and assigns to each his regulated task …” (Ure 1835, 18).

Engels would conceive his own materialist philosophy of nature against Huxley’s sceptical methodological naturalism, but also against several prominent German proponents of materialist philosophy who had claimed in popular books of the 1850s that all phenomena—including thought—could be reduced to the relationship between force and matter. Engels laid out his dialectical materialist philosophy in three key texts: Anti-Dühring (first published during 1877 and 1878); Socialism: Utopian and Scientific (written in 1880, and translated into English by the English biologist Edward Aveling in 1892); and in a collection of unfinished notes and papers posthumously published as Dialectics of Nature. These notes were written over a period between 1873 and 1882, and first published in Russian and in German in 1925. They were subsequently published in English translation in 1940, and included a preface and some notes written by the English evolutionary biologist and Marxist J. B. S. Haldane. The material that would become the Dialectics was never published in any form during Engels’s own lifetime. Two pieces from the jumbled collection were published in the nineteenth century shortly after Engels’s death, including a piece specifically dedicated to human evolution, ‘The Part Played by Labour in the Transition from Ape to Man’ (part of a longer planned work which Engels never completed)—first published in Die Neue Zeit in 1896. ‘Natural Science in the Spirit World’ was published in the yearbook Illustrierter Neue Welt-Kalender in 1898.

Darwin is a crucial figure in Engels’s dialectical materialism. However, in the secondary historical literature, it is often very difficult to untangle claims made about the relationship between the ideas of Darwin, Engels and Marx from the partisan allegiances and political aims of historians and commentators. Moreover, Engels’s philosophy of science is often discussed only insofar as it represents a ‘problem’ for interpreting Marx’s philosophy of history. A number of scholars sympathetic to Marx, for example, have been narrowly preoccupied with whether Engels’s views about Darwin (Ball 1979) or his philosophy of natural science more generally (Carver 1980) should be admitted as compatible with

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24 Aveling was also for a time the partner of Marx’s daughter, Eleanor.
Marx’s historical materialism. Terence Ball has argued that there exists a “Marx-Darwin myth” which suggests that Marx saw his laws of historical development as having strong parallels with Darwin’s theory of organic evolution, a myth he claimed was fostered by “Engels and the Socialist Darwinists” (Ball 1979). Engels, in seeking to give Marxism scientific authority by embedding Marx’s laws of social history within a strictly materialist science, is here held to have strayed from Marx’s humanistic focus into more dubious realms of scientific, and even biological, determinism, which in turn distorted the Marxist project. Terrell Carver has protested that there is nothing in the Marx-Engels correspondence nor in any of Marx’s own writings about the relationship between social and natural science to support Engels’s “grandiose” theory of nature (Carver 1980, 363), and concludes Marx “never endorsed” Engels’s materialist dialectics (363).

These authors can be read as reacting to some twentieth-century scholarship, hostile to Marxism, which made much of a supposed link between the political aims of Marxism and Darwin’s theory of the struggle for existence. Gertrude Himmelfarb thought Marxism could legitimately be taken as a form of Social Darwinism, where, “species being the counterpart to class” (Himmelfarb 1959, 348), a struggle unfolds between the classes, with society eventually progressing according to inevitable natural laws. And it is certainly true that Marx and Engels both invoked the image of the struggle for existence, and discussed Darwin, sometimes with approval, in their writings. But the manner in which they did so provides scant evidence for the claim they were social Darwinists.

For the Marx scholar and later, neo-conservative, sociologist Lewis Feuer (Feuer 1977), Marx and Engels, riding “the Darwinian wave”, are to be read as having developed a biological sociology that regarded the class-struggle as “the form which the struggle for existence took in class societies; the materialistic conception of history was derived as a limiting case of the biological struggle as it obtained for the conditions of the human species” (110). For Feuer, evidence of the supposed “measure of [Marx’s] intellectual transition from a Hegelian
materialism to a socialist Darwinism” (110) can be found in language employed in the 1873 postface to Capital (and indeed, the term “social organism” and some reference to evolution as analogous to economic life appears here (Marx 1990, 101)—but in a lengthy quotation from a Russian reviewer of an earlier, Russian edition of Capital).

This all seems to be the hyperbolic product of twentieth-century culture wars. In a more grounded analysis, Angus Taylor (1989) points out that there is no real textual evidence to link the economic theory laid out in Capital to Darwin’s theory of evolution in a way that could plausibly legitimise the claim that Marx derived his economic theory from Darwinian biological ideas.

Nonetheless, the use of biological terminology and metaphor in Capital generally is striking, and Engels’s and Marx’s interest in Darwin is more than noteworthy. Guiliano Pancaldi (1994) suggests a more plausible kind of affinity between Darwin’s theory of evolution and the views of both Marx and of Engels. Pancaldi argues that what Marx found to intrigue him in Darwin was not that Darwin’s theory of organic evolution coincided literally or could be made identical with Marx’s own views about the processes of history25, but that Darwin could be interpreted as putting forward a theory about the technology of nature—and this in turn was both suggestive and useful for Marx’s own materialist account of history. My own reading of Engels builds on this insight.

25 Marx, in fact, touted at least one alternative evolutionary writer whom he thought much more compatible with his own political ideas—the French geologist Pierre Trémaux. His conception of evolutionary change was preferred by Marx over that of Darwin because, as Marx wrote to Engels, it showed progress in human evolution to be ‘necessary’ rather than ‘accidental’, linking, as it did, the evolution of life and with the nature of earth formations, and even suggesting that races themselves could degenerate if they migrated to geologically inferior terrain. In revealing correspondence, Engels wrote back to Marx with snorting derisiveness, dismissing—with surely more than a hint of what modern ears would construe as ‘racism’—the French geologist’s idea that local conditions might cause the development of racial types. It was a “pretty notion”, Engels thought, to blame the surface of the earth for the “differences between a Basque, a Frenchman, a Breton, and an Alsation … Perhaps this man will demonstrate in the 2nd volume … how he explains the fact that we Rhinelander on our Devonian transitional massif did not become idiots and NIGGERS ages ago, or else he will assert that we really are NIGGERS” (Engels to Marx in London, 2 October 1866, Letter 190, Collected Works of Marx and Engels, Electronic Edition, Volume 42: 2003. Charlottesville: InteLex Corp). For discussions on Trémaux, and a critique of the dubiousness of the received (Marx-Engels) view of his work, see Wilkins and Nelson (2008). For an historical discussion of nineteenth century Marxist views on race and culture, and an exploration of the gaps in the historical discussion and record in the Marx-Engels literature, see Paul (1981).
I have already described above one way in which Marx employed an evolutionary theme in his discussion of the life cycles of machines. In a similarly suggestive footnote in *Capital*, Marx wrote with evident approval that Darwin’s ideas drew attention to the history of natural technology, where the “the organs of plants and animals” can be seen as “the instruments of production for sustaining their lives”. The “history of the productive organs of man in society” deserved, Marx wrote, “equal attention” (Marx 1999, 493). While Marx here neatly exploits the fact that both natural history and human history are active, contingent and productive and above all, material processes, this is surely a rhetorical employment of Darwin. It is hardly evidence warranting the conclusion that Marx conceived of his program as a biological and Darwinised socialism.

5.3 Marx—Engels—Malthus—man

However, my principal interest in this chapter is not really whether Engels or Marx were, or were not, “Darwinians”. I have given my view. Nor am I chiefly concerned with whether Engels’s dialectics of nature was a legitimate or authentic interpretation of Darwin’s (or Marx’s) ideas. Neither do I address the technical matter of the veracity or accuracy of the scientific claims underpinning Engels’s *Dialectics of Nature*. Errors in the parts of the *Dialectics* dealing with biology have been identified by J.B.S. Haldane (in his introduction to Engels 1941), Stephen Jay Gould has quibbled with it (Gould 1995), and mistakes in the sections on the physical sciences have been pointed out by a commentator no less qualified than Einstein. Einstein thought Engels’s physics and mathematics were confused, but that the thrust of work itself was of considerable historical interest (Hunt 2009).

My interest here is specifically in the shape and form of the claims about man and nature that Engels made, drawing on his reading of Darwin, and how he directed this reading of Darwin to support his own materialist philosophy of nature. Both Engels and Marx saw Darwin’s theory of common ancestry as
providing empirical evidence about human origins that could be used to support, advance and develop their own projects. They found much in Darwin’s theory of evolution that was compatible with and useful to their aims. Darwin, they agreed with much satisfaction, had delivered a fatal blow to at least one kind of teleological argument—that in which the divine is seen as manifesting in the material. (This was something Ernst Haeckel also enthusiastically praised Darwin for). But both the German socialists had reasons to be ambivalent about important components of Darwin’s evolutionary theory. Far from Darwinising socialism, if anything, it was the other way around: Engels sought to give common ancestry his own political spin. Engels emphasised those aspects of Darwin’s theory most compatible with his own revolutionary agenda. He dismissed what many others regarded as being central to Darwin’s theory (Darwin’s Malthusianism) as incidental, and in the case of the “struggle for existence”, Engels identified it as precisely that which was to be overcome if humanity was to lay claim to the full advantage of evolutionary endowments that were unique in the natural world.

Engels read the *Origin* in 1859, and enthused to Marx that Darwin was “absolutely splendid”.

*Never before has so grandiose an attempt been made to demonstrate historical evolution in Nature, and never to such good effect. One does, of course, have to put up with the crude English method* (Engels to Marx in London, Letter 313, *MECW Volume 43*, p. 551).

Ever with an eye for opportunity to promote his own ideas against those of his opponents, Marx wrote in 1861 to the socialist Ferdinand Lassalle that “it suits me well that [Darwin’s book] supports the class struggle in history from the point of view of natural science” (Marx to Lassalle in Berlin, January 16 1861, Letter 51, *Selected Correspondence*, p. 115). He, too, complained about Darwin’s “crude English” argument, but concluded with satisfaction that “despite all deficiencies”
Darwin had dealt a “death-blow” to teleology in the natural sciences, setting forth “[their] rational meaning in an empirical way” (II5).

Darwin’s form of argument, as I have mentioned previously (chapter 2) also frustrated Huxley, who characterised Darwin’s method as resulting in a book that read like an intellectual “pemmican”, and worried that this exposed Darwin to unnecessary criticism. Ernst Haeckel, conversely, in his popular *History of Creation* (1868) praised Darwin for providing an “overwhelming apparatus” of evidence (Haeckel 1880, 28) that could not be ignored. Feuer has rather scoffingly retorted to Marx’s charge of crudity that Marx may have preferred Darwin follow a more suitably Marxian method, with “20 pages or so of an aprioristic discussion” preceded by an analysis of the “presumably dialectical ‘contradiction’ in the concept of species” (Feuer 1977, II9). This jibe smacks of his uncharitable and ideological intent, but does also get at a more just, if obvious, point: Darwin was no systematising philosopher, while Marx’s enthusiasm for systematising is notorious. The point here is that neither Marx (who, avowing himself to be an admirer sent Darwin a copy of *Capital* that was to languish largely unread) nor Engels (who would enthusiastically utilise Darwin’s theory of ancestry to support his own dynamic and materialist conception of man’s place in nature) read Darwin without disagreement (Meeks 1953, Taylor 1989, Desmond and Moore 1992, Hunt 2009).

Particularly germane to their ambivalence was their political squeamishness over the inspiration that Darwin had found in Malthus. Engels, for example, wrote to a correspondent in 1875 that he accepted the theory of evolution but took Darwin’s “method of proof (struggle for life, natural selection) only as a first, provisional, imperfect expression of a newly discovered fact” (Engels to Lavrov in London, November 12 [-17] 1875, Letter 156, *Selected Correspondence*, p. 283).

The whole Darwinist theory of struggle for existence simply transfers from society to living nature Hobbes’ doctrine of *bella omnium contra omnes* and the bourgeois-economic doctrine of competition together with Malthus’
theory of population. ... (I question its absolute permissibility, particularly as far as the Malthusian theory is concerned)—the same theories are transferred back again from organic nature into history and it is now claimed that their validity as eternal laws of human society has been proved. (284)

This echoes the sentiment in an often-quoted letter from Marx to Engels in 1862, where Marx writes, in a tone of indulgent amusement, of Darwin applying Malthus’s ideas to plants and animals “as if [Malthus’s] whole point were not that he does not apply the theory to plants and animals, but only to human beings” (Marx to Engels in Manchester, 18 June 1862, Letter 55, Selected Correspondence, p. 120).

Engels, as it turned out, did provide what Marx hadn’t: a dialectical spin on the concept of species. While Engels would argue in *Anti-Dühring* that Darwin had indeed made a great “blunder” in “accepting the Malthusian theory so naively and uncritically” (Engels MECW Vol. 25, 64), he did not deny the reality of a struggle for existence in nature. Instead, Engels emphasised it as a dialectical natural process. The struggle for existence as Engels here rendered it represented a “contradiction”—the overlay of the ideologically loaded Malthusian economic terms was an unfortunate mistake, but inessential to Darwin’s theory.

... [No] Malthusian spectacles are required to perceive the struggle for existence in nature—the contradiction between the countless host of germs which nature so lavishly produces and the small number of those that ever reach maturity, a contradiction which in fact for the most part finds its solution in a struggle for existence—often of extreme cruelty (MECW Vol. 25, 64).

The virtue of Darwin’s conception of evolution, as Engels laid it out in *Anti-Dühring*, was that Darwin provided scientific thinkers with an impetus to learn about the causes of the variation in nature, which would provide a foundation for a scientific, and crucially, non-teleological, understanding of how difference and change operated in the organic world. Taking inspiration from the correct way of
studying change in the natural world would, Engels thought, put the study of social change on a scientific footing.

So both Engels and Marx, neither noted for their propensity to forgive ideological opponents, could overlook Darwin’s Malthusianism, because the Darwinian theory of descent provided something ultimately far more useful. It was undeniably fertile ground for a materialist epistemologist. As with Huxley, who could bracket his reservations about natural selection, Engels and Marx could likewise bracket Malthus, while enlisting more broadly the compatible (and useful) theory of common ancestry in which species—including man—were the products of a contingent natural history. For as Angus Taylor suggests, there is at the very least one easily overlooked fundamental methodological compatibility between the Darwinian theory of evolution, the Marxian view of history, and Engels’s scientific theory of dialectical materialism. The methodological compatibility Taylor refers to is drawn from the idea of descent with modification, a view in which “the structural constraints implicit in society’s metabolism with nature regulate, but do not predetermine, the social changes made from generation to generation by human agents in pursuit of their own goals” (Taylor 1989, 423) 26.

5.4 Descent, with modification

Engels had found in Darwin’s ideas something that he would place great emphasis on when shaping his own dialectical materialism. In Ludwig Feuerbach and the End of Classical German Philosophy (1886) he put it in a nutshell: the

26 There is, of course, a tradition of reading Marx which takes his theory of historical process to be a thoroughly deterministic one, and even goes so far as to insist Marx denied the existence of ‘human nature’ (‘das menschliche Wesen’) tout court, collapsing it into the idea that human nature has no existence except as the determined product of the ensemble of human social relationships. Norman Geras, in a penetrating study of this claim (Geras 1983), argues that this is an implausibly strong interpretation, and that Marx did not reject the idea of a biological ‘nature’ of man (with a set of physical needs of course arising organically from that). Rather, his target was the naive idealist abstraction of ‘human nature’ as a permanent or stable metaphysical ‘essence’ inhering in each individual, and not susceptible to the effects of historical forces. Indeed, in The German Ideology (1845–6) a chief criticism of Marx and Engels was precisely that Christianity denied the ‘natural human’ by instantiating this false ‘essence’, as if “my natural desires, my whole character, do not belong to myself—... this is the doctrine of Christianity” (MECW Volume 5, p. 254).
significance of the Darwinian theory of descent, he claimed, began with the “proof which Darwin first developed in coherent form that the stock of organic products of nature surrounding us today, including man, is the product of a long process of evolution from a few originally unicellular germs, and that these in turn arose from protoplasm or albumen, which came into existence by chemical means” (MECW 26, 385–6).

Engels’s philosophy of science linked three “great discoveries” (385) of the natural world: the cell, the transformation of energy, and Darwin’s evolutionary theory. Darwin’s theory, for Engels, offered the possibility for a unifying scientific account of the relationship between thinking and being—“of the mind to nature”—a relationship that was, for this most trenchant critic of idealism “the paramount question of the whole of philosophy” (366). In Ludwig Feuerbach, Engels talked of idealism and materialism in a generalised and quite straightforward way. Those who “asserted the primacy of mind over nature” (366) comprised the camp of idealism, while those who regarded nature as primary, Engels claimed for the “various schools” (366) of materialism. For Engels, the principal limitation of eighteenth-century materialism had been its crude mechanicalism. Eighteenth-century materialist thought still wore the “swaddling clothes” of its Cartesianism: “What the animal was to Descartes, man was to the materialists of the eighteenth century—a machine” (370). (Marx had startlingly pointed out in Capital that men were indeed machines, but in a radically different sense to that intended by La Mettrie and other mechanists). However, Engels had a more pressing point: that the philosophical systems of the eighteenth-century materialists had been an impediment to comprehending the physical world as it really ‘is’: that is, as a ceaseless and uninterrupted process of change and dynamic development. This was no particular reproach, since Engels took it as an inevitable consequence of the limited, mechanical view of nature following the scientific knowledge of the time.

The history of the evolution of the earth, geology, was still totally unknown, and the idea that the animate natural beings of today are the result of a long
sequence of evolution from the simple to the complex could not at that time scientifically be put forward at all. The unhistorical view of nature was therefore inevitable. (370)

Engels found in Darwin’s account of evolutionary change as a ceaseless process of interaction between organisms and their environment a much more seductive kind of science to underpin his new vision of materialism. Darwin was therefore used to emphasise fundamental differences between Engels’s dialectical materialism and the materialistic views that had been laid out in the mid-century by German thinkers like Carl Vogt and Ludwig Büchner, and the Dutch physiologist Jacob Moleschott. 27

Vogt’s and Büchner’s popular tracts on materialism had claimed that the physical world reduced to the fundamental and eternal relationship between force and matter. In *Force and Matter* (1855)—written for a lay audience and revised and republished numerous times over subsequent decades—Büchner stated that nature consisted only of matter, which he considered uncreatable, indestructible, and inseparable from force (although the two were not the same). Everything could be reduced to matter and force operating together according to fixed mechanical laws. In Büchner’s own words “if matter be imperishable; if there be no matter without force, nor force without matter;—then there can be no doubt the world was not created, but existed from eternity” (Büchner 1864, 8). This, in turn, had a particular implication: every event that has happened, or will happen, in the world, is pre-determined in accordance with these eternal and unchangeable natural laws (Frederick 1977a).

This materialist position obviously denied both a creative personal god and spiritual purpose in nature. But Engels, in *Ludwig Feuerbach* rejected this

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27 Marx, during the 1850s, engaged in a public and acrimonious political brawl with Vogt, attacking his political allegiances in a pamphlet, *Herr Vogt* (Sperber, 2013). Vogt’s scientific materialism and anti-authoritarianism led him to adopt a form of anarchism that claimed that unlike animal societies, which tended to subordinate the individual to the whole, human societies were strengthened as individuals in them freed themselves from state control. Gregory (1977b) points out how close this view was in spirit to Manchester laissez-fair capitalism. Vogt later became a noted populariser of Darwin, although denying that Darwinism naturally implied any particular political system or structure.
formulation of materialism, and attacked its proponents as “vulgaring peddlers” (MECW 26, 371). It was a static and unhistorical system, he argued—conspicuous in its failure to suggest a plausible window for explaining for how living organisms might come into being.

Materialism, in the nineteenth century was, as we have seen, a term of contested meanings, just as “evolution” and “Darwinism” would be (Mandelbaum, 1971). Ernst Haeckel, for example, saw Darwin’s theory of descent as vindicating the triumph of a monistic and unified conception of nature in which inanimate rocks, flowering plants, oceanic currents and sentient animals alike were all equally the manifestation of unfolding laws (Haeckel 1868). Haeckel viewed Darwin’s theory of the natural origins of the world as incontrovertibly establishing that unity, while at the same time, banishing the need for explaining it with reference to teleology or vitalism, miracles or benevolent Creators. He expressed this monistic view in his *Generelle Morphologie Der Organismen* (1866) with an unabashed frankness alien to Darwin’s manner, and which the cautious and reserved Englishman nervously feared would be as likely to make him enemies as it would converts.

The materialist ideas of Vogt and Büchner had also been polemical. They too wanted to do away with immaterial souls, idealism and vital forces. Explanations for natural phenomena did not require “any external power existing outside of things” (Büchner 1855 quoted in Gregory 1977b, p. 106). This claim, of course, required them—within the logical constraints of their system—to account for thought. Moleschott had written vaguely that thought was a motion of matter, and Karl Vogt that thought had the same kind of relationship brain in the same kind of relationship as bile to liver or urine to kidney (Gregory 1977a)—though admitting the comparison to be coarse (cited in Büchner 1864). Büchner, however, rejected this altogether, denying thought was materially permanent (Gregory 1977b). It was neither material nor a substance, but the effect of the
“conjoined action of many materials endowed with forces or qualities” (Büchner 1864, 136). It was just a particular form of expression of the force of life.

Thought, as such, was bound by the same fixed and mechanical laws of nature that governed all force and matter. Free will—if it could be said to exist at all—could do so only under the ultimate limitations imposed by mechanical necessity. Moreover, this necessary reduction of all things back to these fundamental and eternal laws of matter and force implied that even an individual’s conduct, manner, and action were also dependent on, and indeed a necessary product of, the conditions at their birth—conditions including one’s race, one’s social circumstance and one’s nation.

Vogt, Moleschott, and particularly Büchner, were all attracted to the ideas of Darwin—Frederick Gregory suggests the attraction may have in large measure been Darwin’s omission of a creator, and his generally naturalistic orientation. Moleschott’s sympathy for Darwin, for example, was tempered by his appreciation of Lamarck, while Vogt was no uncritical Darwinist. But in Man in the Past, Present and Future, Büchner—strongly influenced by the theory of descent described by Darwin, and also by the account provided in Huxley’s Man’s Place in Nature—endorsed a naturalistic account of human evolution which he tied explicitly into a theory about social and political progress and ultimate destiny of mankind (Büchner 1872). Büchner’s argument is of interest to me here because of the extreme and uncompromising statement he made about the supremacy of man’s place in his Darwinised nature.

Büchner certainly rejected the form of anthropocentrism that would, by assuming man to be the specially created product of supernatural laws, make men the object of nature. Nature, he wrote, doesn’t have that kind of intent or purpose. Moreover, the theory of evolutionary descent with gradual modification (the gradual aspect was something Büchner especially emphasised) must also
lead to the conclusion that the emotional and intellectual lives of animals have been “greatly underestimated”:

Intellectually, morally and artistically the animal must be placed in a far higher position than was formally supposed ... the preeminence of man over the animal is therefore relative rather than absolute ... (Büchner 1872, 137)

That said Büchner remained committed to a progressive view of the future of mankind, and the conclusion that nothing “higher or more perfect” had been produced by nature than civilised man. It was, therefore, not just the right, but the duty, of civilised man to “regard himself as the ruler over all existences accessible to him and to guide and change them as much as possible for his own necessities and purposes” (149). Urging that Darwin himself had underestimated the influence of the external conditions of life on evolutionary change, Büchner saw the struggle for existence transformed, with human evolution, so that the evolution of the human species now occurred almost entirely in the political, social and scientific domains. “Rational spontaneity” had replaced “the blind force of nature” (154), and this, rather than blind natural selection, was the force that now drove the evolutionary process by which humans guided nature for their own ends.

One natural consequence of this process, he supposed, would be “the destruction of the weaker and a constant increase of the stronger or more intelligent races” (156). Büchner saw this as likely being inevitable—although, opposed to the use of force to attain political goals (Gregory 1977b), he urged that this ought not to be achieved through the morally degrading use of violence. Instead, it should occur through the power of conviction. Büchner assumed that the ultimate victory of the “civilised” human over the savage could be achieved by reasoned persuasion rather than at the point of a gun, since, he claimed, “mere example generally suffices among the civilised nations of the earth to render every progress, every improvement, every increase of knowledge common property!” (158).
Central to this thesis was his powerful conviction Darwin’s theory of descent naturally implied that the further man departs from his natural origins, “the more does he become man” (160). Büchner’s Darwinian thesis, however, also endorsed the idea that a healthy evolved human social state would share the characteristics of a healthy organism. This was an idea deriving not from Darwin, but via a tradition following from the German pathologist Virchow, who in 1855 had described organisms as “a society of cells, a tiny, well-ordered state” (Reynolds 2008). Büchner’s healthy state was predicated on the appropriate division of labour, and an “uninterrupted ebb and flow ... [and the] ceaseless interchange of juices between the whole and the individual parts and the great central points”. Each “cell” (human individual) would function individually, but also contribute to the existence of the whole.

This Paradise of the future will not be imaginary but real ... it will come not at the beginning but at the close of our development, and ... it will be not the gift of a Deity, but the result of the labours and merits of man and of the human intellect. (162)

It was in opposition to the view that mind and reason were the decisive forces in human evolution that Engels had in his mind when he enlisted Darwin as an ally in his own energetic philosophy of nature. Scattered correspondence from Marx merely sidelines Büchner as a lightweight populariser. Typically, Marx’s sniping is directed at Büchner’s rival formulation of materialism. On his views about Darwinism, Marx is silent. Engels, however, did link his criticism of the rival materialists directly to their use of Darwin—whom he had every intention of claiming in support of his own materialist theory. In an 1875 letter, he griped that Büchner, Vogt and Moleschott had once emphasised co-operation in organic nature “until Darwin’s time”—now they see everywhere “only struggle”. Whereas, Engels wrote, neither struggle nor co-operation should be privileged: the interaction of bodies in nature “includes both harmony and collision” (Engels to Lavrov in London, November 12 [-17] 1875, Letter 156, Selected Correspondence, p.
In the notes later included in the *Dialectics* Engels repeats this political criticism, accusing Vogt, Buchner and Moleschott of a shallow populism that opportunistically “reaped” the fruits of Darwin’s popularity in Germany to revive the flagging fortunes of their materialist science (Engels 1941, 152).

One might, Engels snorted, “let them alone” but for one thing: their “presumption” in “applying the nature theory to society and reforming socialism” (152-3). This was a barb aimed directly and squarely at “Büchner’s claim to pronounce judgment on socialism and economics from the struggle for existence” (155). Engels’s additional notes and references to this remark, although cryptic, taken in context seem to suggest that he thought Büchner’s formulation was based on a shallow knowledge of the science, but more significantly, that he had then unconsciously imposed his own political beliefs onto this misunderstood science (Engels 1941, 155; and Appendix II, Source References to Engels 1941, p. 337). Engels’s scattered unpublished notes point to his central criticism of Büchner’s use of Darwinism. This was that the rational society that Büchner imagined humans as naturally evolving toward was one based not on natural laws (as was claimed), but Engels argued, on laws that man “produced out of his head” (1941, 155). Engels objected here—as always—to the primacy given to the mind over the material forces of nature and technology.

Engels’s dialectical materialism literally welded the fate and development of mankind into a dynamic historical relationship between nature’s fundamental energetic forces and the ceaseless social processes of production that he saw as driving human history—much as Marx had situated the industrial worker as the extended body of the machine. Engels complained in *Anti-Dürhing* that the “naturalists who have learned to think dialectically are few and far between, and this conflict of the results of discovery with preconceived modes of thinking explains the endless confusion now reigning in theoretical natural science” (*MECW* Vol. 25, 24). The concept of dialectics is often simplistically thought of in its classical form of ‘thesis-antithesis-synthesis’—however, Hegel himself did not
apply the term ‘dialectical’ in this classical sense (Berlin 1939), and nor did Engels. Engels summed up thinking dialectically as being the capacity to comprehend things, ideas and representations in “their essential connection, concatenation, motion, origin and ending” (MECW Vol. 24, 301)—in other words, being aware that ideas were themselves formed as the product of dynamic and contingent historical processes and manifold interactions, not fixed or eternal essences. For Engels, Darwin was to be praised for showing that nature itself worked the same way: evolving dialectically and “not metaphysically” (24). The great merit of Hegel’s system, Engels said, was that it represented history as process, change and transformation. But the formulation needed to be applied to and take as its starting point the material world.

An exact representation of the universe, of its evolution, of the development of mankind, and of the reflection of this evolution in the minds of men, can therefore only be obtained by the methods of dialectics with its constant regard to the innumerable actions and reactions of life and death, of progressive or retrogressive changes. (MECW Vol. 25, 24)

This continuous dynamism extended right to the fundamentals of organic being. All living things were at “every moment the same and not the same.” It was as impossible to define the moment of birth as it was to determine the moment of death—death itself was in fact dying; “not an instantaneous momentary phenomenon, but a very protracted process”. Every organic being “is always itself, and yet something other than itself” (23).

5.5 History out of hand

History, of course, was crucial to Engels’s conception of man in nature. In The German Ideology, Marx and Engels had written that man began to distinguish himself from animals when he began to produce his own means of subsistence (MECW Vol. 5, 1975). Engels’s later writings on nature do not stray from this starting point. But this kind of claim did make History an exclusively human possession. Animals, Engels allowed, had a natural history. This was the story of
their descent with modification and their gradual morphological change—a history revealed by Darwin. But animals were not, on Engels’s reading, historical entities. History properly construed began, for Engels (and he did not differ in this from Marx) when humans, taking up tools, began to produce the world.

By taking up tools, Engels argued that the human animal began to remove itself from the world of all other animals. This process continued as technologies evolved, eventually driving a widening gap—and yielding a markedly different kind of animal. This account might seem, at first, to have similarities with that laid out by Büchner. But the crucial difference is that Engels saw this differentiation as driven by the production and the exchange of the means to support human existence. It was these material forces and technologies, not the rational mind, which throughout history formed, and crucially, re-formed, the content of human consciousness. No thought existed purely as the thought of individual man, untouched by a language—if this were possible, then animals would in fact be “the most abstract and purest thinkers” (78). Thought itself “exists only as the individual thought of many milliards of past, present and future men”, as he put it in Anti-Dühring (MECW Vol. 25, 79). Any present thought was the product of the constant re-examination and modification of the body of human thought to date. But crucially, thoughts were only possible subject to the possibility of social conditions producing them. Thus, Engels thought, a society where the social motives and causes for stealing were removed, the statement ‘though shalt not steal’ would be a laughable proposition—were it to make any sense at all.

Büchner’s philosophy of nature had supposed that increasingly rational human thought must be a necessary, progressive consequence of the mechanical unfolding of the basic laws that governed all of nature, even though “those who laid the first foundations of this great edifice could have no suspicion of its future grandeur” (Büchner 1872, 71). In this increasingly emancipated mental state as he
imagined it, Büchner thought man’s mastery over nature would be an inevitable—but increasingly, a mind-dependent and mind-driven—process.

On the contrary, said Engels, mastery over nature began with “the development of the hand, with labour, and widened man’s horizon at every new advance” (Engels 1941, 282). Yet men were not outside nature and its laws. Sometimes, nature took its own unexpected revenge—because the future consequences of any present action could not easily be foreseen. Progress was therefore far from inevitable. Picking up on a very nineteenth-century theme, for example, Engels also believed that racial types could physically degenerate “to a more animal-like condition” under the pressure of environmental poverty and the material conditions of their existence (281), although, with Darwin, he thought the lowest savage would still be far superior to the apes—those “transitional beings” (281).

The unforeseen effects of changing modes of production exchange could be catastrophic. With the spread of the potato into Europe came scrofula. Deforestation produced aridity and famine. Technology, in other words, could get out of hand—following a law-bound logic but at any present moment, existing only as sum total of the countless accidents and contingencies resulting from these iron laws. In the introductory notes for his sketch of the Dialectics of Nature, Engels wrote of the often “colossal disproportion” (1941, 19) between the proposed aims of human activities and interventions, and the actual outcomes. In the real world, technologies escaped the intention of their human makers: “unforeseen effects predominate, and ... the uncontrolled forces are far more powerful than those set into motion according to plan”. Here was the “interplay of unintended effects from uncontrolled forces” by which even machines themselves might become themselves willing organisms, following natural laws, even as they increased the misery of the masses with overwork, rather than freeing man from toil. This was the very historical process that yielded Marx’s visceral factory organisms of Capital.
The struggle for existence, in the age of capital, had not been overcome by the triumph of the human individual. For Engels, this struggle raged on all-consumingly, defining the age. Marx had described labour as a process by which man mediates, regulates, and purposefully directs the metabolism of nature. In this picture, the natural world was man’s universal instrument. But unlike Büchner’s healthily regulated organism-state, the metabolic process described by Engels was one liable to dramatic dysfunction—even catastrophic failings. The solution, Engels supposed, lay in “gradually learning to get a clear view of the indirect, more remote, social effects of our productive activity ... affording us [the possibility] of mastering and controlling those effects as well” (294).

Darwin, Engels wrote in what became the *Dialectics*, had produced a “bitter satire” (1941, 19), without even realising it, when he linked his view of nature to individual competition and a struggle for existence. For Darwin had, according to Engels, unwittingly revealed that in the capitalist economy we see what is actually the normal state of the *animal* kingdom: a struggle and competition for survival, in which “only the nearest, most immediate results” (295)—what was profitable for the capitalist at any particular moment—would survive and prevail.

The interest of the ruling class became the driving factor of production ... the individual capitalists, who dominate production and exchange, are able to concern themselves with the most immediate useful effect of their action (1941, 295).

The further consequences of particular human actions, which “only appear later on and become effective through gradual repetition and accumulation” (294), are neglected, he argued. Engels argued that this was precisely what men needed to escape, by purposefully directing production, rather than leaving it to the blind operation of untrammeled capitalist competition.

To do this, he argued that it was first necessary to get the story of human evolution in the right order. In the ‘The Part Played by Labour in the Transition
from Ape to Man’, Engels argued that the evolution of an upright gait in humans had freed the hand for tool use, and then, as labour adapted to the ever-new requirements of its operations, this drove increased intelligence, and finally, speech. The hand-mind relationship in human evolution was a dialectical process:

... step by step with the development of the hand went that of the brain; first of all came consciousness of the conditions for separate practically useful actions, and later, among the more favoured peoples and arising from that consciousness, insight into the natural laws governing them. And with the rapidly growing knowledge of the laws of nature the means for reacting on nature also grew; the hand alone would never have achieved the steam-engine if, along with and parallel to the hand, and partly owing to it, the brain of man had not correspondingly developed. With man we enter history (1941, 18)

Both Engels, and later, Stephen Jay Gould, attributed what Gould (Gould 1995) called the entrenched idea of “cerebral primacy” (of mind driving human development) to a bias in nineteenth-century scientific thought that flowed from the errors of idealist philosophy. Gould writes that Engels presents the idea that hand, rather than mind, drove evolution as though it was an original and logical deduction from the premises of his own philosophy, and grumbles that Engels does not anywhere acknowledge what Gould presumes was the source of this insight—Ernst Haeckel’s prior postulation of a human ancestor of upright posture. Nonetheless, The German Ideology, written some thirty years before, opens with this famous salvo against the errors of Western metaphysics: “Hitherto, men have always formed wrong ideas about themselves ... the product of their brains has got out of their hands”—suggesting that whether or not Engels failed to acknowledge Haeckel’s postulated ancestor as evidence or inspiration for his claims in this essay, there was at least an openness to the implications of the idea that can be traced back to Engels’s early philosophy.

Engels argued, in part, that history was a product of men alone because animals had no consciousness of time or of death. But technology was crucial to the
capacity for this consciousness. Animals were certainly capable of limited kinds of purposive behaviour, but it was only man who increasingly made the environment serve his own ends, to more distant future imaginaries—whereas “if animals exert a lasting effect on their environment, it happens unintentionally” (1941, 291). The animal “merely” (291) uses nature.

Back in the 1840s, in the *Condition of the Working Class in England*, young Engels had already pointed out that the physical conditions in which the workers lived left them akin to animals. Later, he would characterise the capitalist system itself in terms of a struggle for existence in which all were *constituted* by the animal condition. The entire capitalist system of production was presented by Engels as the violent transfer of *animal* conditions onto *human* existence. Capitalist and worker alike were thus denied the fundamental conditions for being fully human.

Advantages in natural or artificial conditions of production now decide the existence or non-existence of individual capitalists, as well as of whole industries and countries. He that falls is remorselessly cast aside. It is the Darwinian struggle of the individual for existence transferred from nature to society with intensified violence. The conditions of existence natural to the animal appear as the final term of human development (*MECW* Vol. 25, 260).

For Engels, the answer to this fundamental problem lay in human beings learning enough about the laws of nature to consciously foresee and seek to deliberately control their future consequences.\(^{28}\) Foreseeing meant understanding not only the immediate *natural* consequences of human actions and productive activities, but also their more remote social consequences. Controlling the social effects would require a revolution in the means of production because for Engels, the capitalist ideology, by naturalising the struggle for existence as the condition of

\(^{28}\) This was a theme that also appeared in the writings of E. Ray Lankester—see also chapter 7— who had become a friend of Marx in Marx’s later life, and through Marx, met Engels. It is difficult to say what influence, if any, Engels’ ideas might have had on Lankester’s. Limited correspondence does indicate that Lankester had at least read *Capital* (Lester 1995). Diane B. Paul, though (Paul 1983), points out that in fact little is known about Lankester and Marx’s friendship, the speculations of scholars notwithstanding.
human social relationships, obscured its effects to us. Humans had to master nature not because this was just or right according to some supposed internal logic of the evolutionary struggle and man’s place in it, but because only when freed from the struggle for existence—the defining condition of being animal—could men truly be human. This picture is surely far from any simplistic kind of Social Darwinism—but it is a strident welding of Darwinian evolutionary themes to anthropocentric ends.

During the twentieth century, some historians would link Engels’s dialectical materialism to notorious developments in Soviet science. The suggestion that Engels was a harbinger of Trofim Lysenko may not stand up well to scrutiny. In A Darwinian Left (1999), for example, Peter Singer begins with the ahistorical claim that Engels’s ‘The Part Played by Labour in the Transition from Ape to Man’ was based on a misunderstanding of Darwin. Engels is supposed by Singer to have “believed that acquired characters could be inherited by future generations, his mode of evolution is Lamarckian rather than Darwinian” (Singer 1999, 21). This both misreads the essay, and anachronistically opposes ‘Lamarckian’ to ‘Darwinian’ inheritance in a way that was by no means so clear-cut in nineteenth-century evolutionary thought. Notwithstanding, Singer then proceeds to link this claimed “naïve” (22) support for the inheritance of acquired characters quite directly to the ideologically-inflected future attitudes to biological inheritance among Soviet scientists and to the famines of the Stalinist era.

Singer also critically draws attention to Engels’s famous remark at Marx’s funeral that “just as Darwin discovered the law of evolution in organic nature, so Marx discovered the law of evolution in human history.” Diane B. Paul (1983) points out that this comparison has often been given great ideological weight by historians and philosophers, usually critical of Engels in doing so—Singer declares it a more “serious” worry than his alleged “Lamarckian lapse” (21). However, a more deflationary and less melodramatic view of Engels remark is perfectly plausible, and has the merit of not requiring unwarranted speculation.
or ahistorical bluster. On this deflated view, Engels—Marx’s devotee, and a political animal to the last—was simply trying to stake a claim for Marx’s own historical legacy by comparing his legacy as on a par with one of the nineteenth-century’s most renowned scientific figures. He was not trying to entwine the names of Marx and Darwin forever in eternal ideological wedlock. David Stack (2000) also suggests the motive of Engels in using those words at Marx’s funeral was a tactical and political one. This is quite in keeping with Engels’s general efforts throughout his work to claim Darwin (albeit with reservations and some considerable re-writing on Engels’s part) from rival brands of socialism. “What Engels’s remark definitely did not represent was any meaningful or successful attempt to unite Marxist politics with Darwinian science” (Stack 2000, 684).

Ultimately, Engels’s radical dialectical materialism staked all on the claim that “[humans] have the advantage over all other beings of being able to know and correctly apply [nature’s] laws” (1941, 292). This was not a humble claim, and in making such an unqualified claim for the capabilities of the species, Engels indubitably deceived himself. Engels also thought that by applying himself to this task, men would “not only feel, but also know, their unity with nature, and thus the more impossible will become the senseless and anti-natural idea of a contradiction between mind and matter, man and nature, soul and body such as … obtained its highest elaboration in Christianity” (293). We are doubtless, in the age dubbed the Anthropocene, more aware than ever of our “unity” with nature—although presumably, not in the way that Engels had hoped for.

The agnostic evolutionary naturalism of Huxley and of Darwin was far more muted in its claims for the possibilities of human beings to “know” the natural world, and to transcend the condition of being animal. Darwin, writing in 1879 and close to the end of his life, doubted that a mind “developed from a mind as low as that possessed by the lowest animal” could ever be fully trusted “when it draws … grand conclusions” (Darwin 2002, 54). Here, he was talking about religious belief, but the sentiment was characteristic: certain kinds of mysteries
were, perhaps, insoluble to flawed and contingently evolved human minds. But when Engels chastised agnosticism as shamefaced materialism, he was giving expression to the fundamental question on which they parted company—and to what he supposed to be the nature of man’s difference from all animals. Only humans were capable of dialectical thought. And “only when natural and historical science has adopted dialectics will all the physical rubbish—outside the pure theory of thought—be superfluous, disappearing in positive science.” (Engels 1941, 244).
CHAPTER 6. DEGREES OF DIFFERENCE: IS THERE A MORAL MESSAGE IN COMMON ANCESTRY?

6.1 Political and other animals

At the heart of Engels’s “dialectics of nature” was the claim that scientific knowledge was the route to reconciling human life with the organic world from which it had emerged through a natural evolutionary process. True consciousness meant kicking free from an older metaphysics to perceive more clearly the operations of nature’s laws. Huxley had doubted nature’s laws could ever be completely known. He also declined to formulate grand systematic claims about history, politics or ethics from the facts of the natural world. His caution frustrated Engels. The idea that political laws for human social organisation could be derived as a subset of natural laws placed Engels much closer to nineteenth-century evolutionary naturalists like Kropotkin and Spencer.

The question of whether there is a moral or ethical message in the natural history of our evolutionary common ancestry is one that would remain very much alive for evolutionary naturalists throughout the twentieth century. So at this point, I will turn my focus from my nineteenth-century readers of Darwin to some influential late twentieth century claims that common ancestry does indeed lead to certain ethical conclusions. The readers of Darwin examined in this chapter have approached this from a rather different perspective to my nineteenth century readers, and draw on insights and developments and developments in the natural sciences such as human and comparative psychology, evolutionary biology, and ethology, but nonetheless found their views on an appeal that goes back to Darwin. They make a rather different point from that of Engels about the implications of our unity with nature. Engels said nothing of the moral status of animals, other than to imply that the proposition itself was an absurd one—they
were not his interest. The natural history of animals was one in which the world was “made for them” and evolutionary processes occurred “without their knowledge and desire” (Engels 1941, 18). Only humans, he argued, could consciously make their own history.

The philosophers I consider in this chapter agreed with Engels that Darwin’s theory of evolutionary common ancestry had stripped Christian dualism of its moral authority by confirming that the human species does not stand as a separate creation outside nature. But they pursued this idea in a very different direction, arguing that evolutionary continuity was fatal to the arguments historically enlisted to justify subordinating the interests of other animals to those of humans and for excluding nonhumans from the sphere of moral consideration. In this chapter, I will critically examine this view. My argument in brief is that the fact of evolutionary common ancestry does not in and of itself yield any unambiguous or clear directives about how humans should treat other species. We can certainly use empirical knowledge from evolutionary studies to examine important questions about how other species experience things like pain or deprivation, or to understand the social formations or cognitive architecture of nonhuman species. But an evolutionary perspective might even undermine, rather than support, at least some of the kinds of philosophical arguments put forward by opponents of what has been termed “speciesism”.

Peter Singer is probably the best-known exponent of the idea that Darwin’s theory of common ancestry exposes as unjustifiable the species-based bias of the Western philosophical tradition. Although Singer does not discuss Marx or Engels in his 1975 classic Animal Liberation, in A Darwinian Left: Politics, Evolution and Cooperation (1999), Singer specifically extended this analysis to examine Marxist humanism. Singer is particularly critical of Engels, admonishing him for the sharpness of the distinction he drew between the technologically and culturally productive capacities of humans and the naturally productive interactions between animals and their environments—the idea that history is
something that happens to animals, while only human beings can actively and consciously author it. To anyone who sees “continuity between human beings and our nonhuman ancestors”, such a distinction is, argues Singer, “implausible” (1999, 23). Singer takes Engels as arguing that “Darwinism gives us the laws of evolution for natural history but stops at the dawn of human history” (23).

Singer's reproof for Engels, like his interpretation of the implications of common ancestry, rests on his emphasis on continuity in evolutionary change. Singer stresses animals and humans as being on an evolutionary “continuum” (17) not just with respect to anatomy and physiology, but with regard to mentality too. A Darwinian Left re-states a claim Singer had famously made some 25 years earlier. The claim is that Darwin, by “knocking out” the intellectual foundations of the idea of humans as a separate creation, “provided the basis for a revolution in our attitudes to nonhuman animals” (1999, 17).

Singer weaves this idea into a broad call for the “political left” to re-think its attitudes towards Darwin. Singer argues that left-wing thinkers have generally been ambivalent about Darwin, and hostile to evolutionary forms of analysis outside of the strict bounds of natural history, in large part because they have erroneously believed in a Marxist theory of history that implies there is no fixed human nature and human nature can be changed by changing social relations (for a thoughtful and convincing critique of this often-made claim about Marx and human nature, see Geras 1990). Singer also believes that left-wing thinkers have been duped by right-wing thinkers who successfully campaigned for the view that a Darwinian “struggle for existence” lends the endorsement of biology to ruthless individualistic behaviour in everything from social policy to financial markets. According to Singer, evolutionary biologists—bar Kropotkin—also fell for this, and essentially ignored cooperation.

Singer thinks the left can “swap Marx for Darwin and still remain left” (7). Following Darwin, and contra (it is supposed) Marx, a Darwinian left-wing
program would not deny the existence of human nature, nor suggest we are inherently good or “infinitely malleable” (60). A Darwinian left movement would recognise that people will respond to mutually beneficial forms of cooperation and so “promote structures that foster cooperation rather than competition, and attempt to channel competition into socially desirable ends” (61). Importantly, such a movement would also “recognise that the way in which we exploit nonhuman animals is a legacy of a pre-Darwinian past that exaggerated the gulf between humans and other animals” and therefore “work towards a higher moral status for nonhuman animals” (61–2). It is this argument to which I will now turn.

Historians Rod Preece (2006) and Rob Boddice (2008) have been critical of claims that Darwin’s conception of evolutionary common ancestry represented a dramatic historical rupture with radically new implications for the moral status of animals. Preece criticises animal rights literature for its “bloated statements about the effects of Darwinism” (2006, 332) pointing to the lengthy pedigree of the study of homology in animals, and the observations of numerous evolutionary speculators pre-dating Darwin who “contributed to the diminution of anthropocentrism” (332). Preece also stresses that Darwin himself offered few revelations about how animals were entitled to be treated. This, however, is hardly a new point, and most writers who have held Darwin’s ideas to have philosophical implications for our treatment of animals have not claimed that Darwin himself held particularly radical views on this topic. In fact, this was a point made by Singer, who criticised Darwin for the fact that he did not take a radical stance on the treatment of animals, despite his own theory of evolutionary continuity (Singer 1975 and 1999).

The concept of a natural continuity between human and nonhuman animals certainly did not originate with Darwin. Preece, however, surely swings his compensatory pendulum much too far in the other direction with the claim that there was “not even anything slightly novel” (339) about Darwin’s analysis of
human-animal continuity in the *Descent of Man* and that Darwin merely extends forms of arguments that had been employed in classical, mediaeval and Renaissance periods “a little bit further” (Preece 2006, 343). Certainly, writers from classical antiquity onwards had written of animals as possessing qualities described at various times as reason, intelligence, passions and sagacity (Ritvo 1987, Boddice 2008). However, none had conceived of this relationship nor, crucially, explained it, in the manner of Darwin’s theory of descent with modification—as an outcome of natural, law-bound processes mechanically indifferent to human moral sensibilities and counter-intuitive to our own deeply-felt convictions (and, as we shall see, by extension, indifferent to the pain and suffering that was a natural phenomenon in the organisms they produced). On my reading, it wasn’t so much that Darwin identified capacities in nonhuman animals which had often (but not always) been denied that had implications for moral theories or ethical practice. It was what he by implication stripped from human beings—when he wrote, for example, that the birth “both of the species and of the individual are equally parts of that grand sequence of events, which our minds refuse to accept as the result of blind chance”. The understanding, wrote Darwin “revolts at such a conclusion” (Darwin 2004, 683). As well it might—but Darwin’s point was that this aversion did not make it any the less the state of things.

Preece and Boddice both draw attention to the fact that although Darwin is accorded particular scientific significance in literature on animal ethics and animal rights, he himself engaged throughout his life in practices that included recreational shooting, hunting, and the breeding, use and killing of animals in research. This all seems to me a merely uncontroversial observation that would be unreasonable to contest. Darwin certainly disapproved of the infliction of cruelty on animals, although in a quite ordinary and commonsense way, as I shall argue—and he went some way in questioning his own practices. As a young man, he had been a keen shooter, but would, in his *Recollections*, reflect with regret on his enthusiasm, remarking he may have even been half-consciously “ashamed” of
his zeal by justifying it as an “intellectual” employment (Darwin [1887] 2002, 27). But he was no cultural radical on animal matters, and in what follows, I will consider this point, since it is sometimes treated by philosophers as sitting uncomfortably with the supposed implications of his ideas.

Animals were always central to Darwin’s life and activities. Often, this meant dead centre. During his Beagle voyage, he collected a vast number of specimens—principally crustaceans, insects, millipedes, sea spiders and other invertebrates. He shot birds, and he ate turtles. At other times, the animals were very much alive. During 1838, Darwin spent time with young orangutan in the London zoo, and his notes from this encounter have now been transcribed and made available. ‘Jenny’ was observant and highly teachable. But she was not just a mimic or passive learner. She also expressed behaviours that suggested the presence of a very definite personal will. She could be “vexed”, “jealous” and “peevish”. She would express displeasure with her mouth, or by turning her back. She preferred a certain cat, but liked no other animals. She was emotionally attached to her two keepers. ‘Jenny’ was not so much like a dog as like a human child (Van Whye and Kjærgaard 2015).

Darwin was famously fond of dogs, and enjoyed their companionship. Several historians—notably, Harriet Ritvo—have explored the social and cultural aspects of pet keeping in Victorian England, including the period’s passion for domestic dogs and dog breeding (Ritvo 1987). Paul S. White (2005, 68) remarks that as family “friends” and “devoted servants”, domestic dogs were a consistent—and a revealing—embodiment of Victorian values, and tellingly, he ascribes this to their moral nature, rather than their intellect. Emma Townshend, in a short study, Darwin’s Dogs, has stressed the importance of the fact that Darwin spent most of his days in the company of dogs, and argues that the animals stimulated his scientific thinking in a number of ways (Townshend 2009).
Dogs—their behaviours, instincts, physiology, breeding habits, descent, and emotions—pepper Darwin’s notebooks. Dogs are a key species in the *Expression*, and a discussion of their descent opens *The Variation of Animals and Plants Under Domestication*. In a well-known passage from the *Descent*, Darwin wrote with pathos of a dog licking the hand of a person who had conducted a painful experiment on it, adding that this man must surely have been haunted all his life by the memory of this scene, or had a heart of stone, unless the experiment was justified by increased knowledge (Darwin 2004, 90).

Yet, when it came to the scientifically, politically and emotionally laden subject of vivisection, he declined to condemn the practice outright. In this, Darwin was by no means out of step with mainstream Victorian scientific culture (Turner 1980, Hamilton 2004a and 2004b). The scientific, moral, cultural and political context for debates about the treatment of animals in Victorian Britain was complex. This broader context is frequently glossed, when not overlooked altogether, by some moral philosophers (e.g. Rachels 1990). Gary Steiner (Steiner 2005) for example—focused on the moral status of animals—dedicates some pages of his book to discussing Darwin’s theory of descent with modification. However, he offers no specific discussion or analysis of the broader nineteenth-century scientific or social context in which Darwin’s ideas about evolutionary common ancestry and his views on matters such as vivisection were formulated. Steiner’s argument is heavily influenced by Robert J. Richards (particularly Richards 1987) and indeed, Richards is the only historian of Darwin Steiner references. Following Richards’s lead, Steiner emphasises Darwin’s ideas as a product of Romantic notions about continuity in the laws governing the physical development of organisms.

Steiner sees “unresolved tension” (196) in Darwin’s views about the relationship of human to nonhuman animals and the evolution of the moral sentiments. On the one hand, he points out that Darwin writes of “man” still bearing the stamp of his animal origins. On the other, Darwin is said by Steiner to believe that because
the “god-like” human intellect “gives us a special place at the apex of creation, and this fact seems to entitle us to certain prerogatives in the husbanding of and experimentation upon nonhuman animals” (Steiner 2005,197). I do not concur that Darwin believed man to have “a special place at the apex of creation”, and his use of the term “god-like” at the conclusion of the Descent is surely not without ambiguity. But let’s start with the second part of Steiner’s remark, by which Steiner seems to imply that Darwin should have rejected the human “prerogatives” of animal husbandry and experimentation on animals, as a logical conclusion of his “scientific account of the myriad similarities between the physiology and the cognitive abilities of human beings and ‘the lower animals’” (190).

Steiner thinks that Darwin is inconsistent on the moral implications of his own theory. According to Steiner, Darwin reduces the “ought of morality to “imperatives of group survival” and “the biological imperative”, while his theory of the development of social instincts as a natural process suggests that there can be “no absolute moral imperative for members of one species to treat members of another species in a particular way” (195). Steiner thinks that this is in tension with Darwin’s own description of sympathy toward animals as a noble sentiment (Darwin 2004), because Darwin does not explain how sympathy toward animals “promotes the survival of any human group” (Steiner 194). The assumption Steiner seems to make here is that the evolutionary emergence of such sympathy requires precisely this form of explanation, because sympathy to animals should be inexplicable from Darwin’s theoretical perspective unless it can be linked to its enhancement of the survival of particular human groups. But Darwin’s point was that in human societies, social instincts once acquired (as Darwin indeed thought) “for the good of community” (Darwin 2004, 149), had become refined by custom and habit into a more general and diffuse principle of benevolence.

Steiner’s claim is that Darwin on the one hand, when he approves of the extension sympathy to animals, appeals to “the capacity of human reflection to
occupy a universal standpoint” (a standpoint supposed by Steiner (196) to be “a well-established philosophical insight”). On the other hand, Steiner thinks, Darwin then retreats from this into a relativist “anthropocentric” moral standpoint (196), ultimately condoning a vision of man at the “apex” of creation. I believe this misreads both Darwin’s moral theory and the point Darwin was really making about the human place in nature—a much more humbling one than Steiner seems to suggest. When Darwin wrote at the conclusion of the Descent that “Man may be excused for feeling some pride at having risen ... to the very summit of the organic scale” (2004, 689), he pointedly reminded his readers that this was “not through his own exertions”. Darwin then added that this “may give him hope for a still higher destiny”—but he actually withheld his own sanction for such speculation, by undercutting it swiftly with the following remark: “We are not here concerned with hopes or fears, only the truth so far as our reason permits us to discover it; and I have given the evidence to the best of my ability” (689). This was actually a deft and subtle rhetorical move, the effect of which was hardly to place humans at the “apex” of “creation”, but rather, to open an ambiguous gap between those excusable “hopes and fears” (surely, an appeal to his readers’ psychology), and the empirical facts about human descent as laid out in the Descent.

Should the fact of our evolutionary common ancestry and biological continuity with other species lead us to particular kinds of conclusions about the permissible treatment of other species? The nub of this argument has been simply expressed by Richard Ryder. Ryder writes that as “Darwinism teaches biological kinship ... we should now be practising moral kinship” (Ryder 2011, 60). Ryder sees this claim as resting on a straightforward analogy between the category species and those of race and gender. The argument against speciesism has also depended (Rachels 1990) on the notion that Darwin’s theory of descent with modification undermines the traditional metaphysical and scientific frameworks used to justify subordinating the interests of other animals to those of humans (ideas like “man was the product of a special act of creation”, “animals
were given to humans to use”, Cartesian dualism, or that particular cognitive capacities are sufficient to afford us a privileged ontological status).

There are good reasons to think the culturally and scientifically contested category species does not present a straightforward analogy with the (also contested, but for different reasons) categories of gender or race. Species can be conceived of, for example, morphologically, by reproductive isolation, phylogenetically, genetically or ecologically (Lewens 2007, Wilkins 2009, and Sandler 2012). With the possible exception of great apes (Singer and Cavalieri [eds.] 1993), it is not clear on what basis clear boundaries for moral equality might be drawn between humans and other, particularly more phylogenetically remote, species. We interact with members of other species in innumerable ways: hosting them (if that is the word!) in our bodies, hunting them, destroying their habitat to build apartments and dams, sharing our beds with them, observing them, or having our legs severed by them while swimming. In such a highly complicated and iterated web, it is far from obvious how, or whether, we could draw consistent conclusions about their value, interests or permissible treatment. Finally, and as Darwin recognised, and others have suggested (Petrinovich 1999), from a biological perspective, there is a legitimate way in which all social animals might be called speciesist.

Moreover, there may be characteristics quite peculiar to the social organisation or cognitive makeup of the human species that are more practically germane for the welfare or treatment of animals than is the fact of our biological continuity. Factory farming affects a huge number of species, from those farmed to those whose habitats are destroyed by its effects. But this is as much a product of our human economic organisation as it is an outcome of historical metaphysical attitudes to animals—and arguably, more relevantly so, as far as its impact on those animals is concerned. Our treatment of nonhuman animals turns out to be (like our treatment of other humans) a vastly complicated matter—involving still-open questions about the biology, psychology and social organisation of both
human and nonhuman animals. It is dependent on numerous practical (rather than metaphysical or abstract) problems—in the very human realms of politics, economics, and ecology, just for starters (M.S. Dawkins 1980, 2012).

6.2 Pain, Darwin and the gnashing of teeth

Ryder (2011) has taken freedom from pain and suffering to be the crucial condition for the happiness of creatures in the Darwinian moral community (although he gives pain a very broad definition which encompasses experiences from agony to boredom to shame). I therefore want to consider some of the important elements of the historical, scientific and cultural context of Darwin's theory of evolutionary descent that have a bearing on the questions of nonhuman animals, pain and sentience. I then want to look specifically at the concept of suffering, arguing that Darwin's theory of evolution makes suffering a radical kind of practical problem for moral philosophy, naturalising suffering in a way that resists dissolution by, in particular, the utilitarian premises of some of the arguments frequently used in this context.29

I will, in the section following on, tie this to a critical examination of some common ways in which philosophers appeal to evolutionary continuity to make particular claims about the moral status of nonhuman animals, and about ethical practice more generally. Finally, I want to consider the relevance of a set of so-called sceptical evolutionary arguments or “debunking” arguments (Kahane 2011, Fraser 2014, Griffiths and Wilkins 2015) that are sometimes taken to suggest that an evolutionary perspective in fact undermines the basis for some of not all of our moral reasoning. I explore the extent to which this does (or do not) bring into question the reliability of some of the assumptions operating in the discourses of moral philosophy. My aim is neither to deny the importance of thinking about

29 Indeed, Darwin set aspects of his own moral theory directly against classical utilitarianism, arguing that humans were just as likely to act from the obscure directions of instinct or habit, without reference to any particular concept of pleasure or happiness, when faced with apparent choices about their conduct (Darwin 2004).
our relationship to nonhuman animals nor to set out an alternative model of argument from first principles about how they “should” be treated. My aim is to demonstrate why trying to found the case for radically altering the way we treat nonhuman animals on an appeal to evolutionary continuity is a problematic enterprise, which does not get us to the place that is often assumed it does, and to investigate alternative construals and readings of common ancestry and what these might mean for some of the claims of moral philosophers in this field of inquiry.

Let’s start with Darwin, and some remarks on the nineteenth-century scientific and historical context of that century’s ideas about pain and sentience. Liz Gray (2014) has suggested that pain should be thought of as belonging not to the history of the passions, nor the history of science, but as a temporal entity: its experiential nature brings the particular “challenge of subjectivity” to its study (Gray 2014, 148). In the Descent, Darwin alluded to the difficulty of understanding this experience in others, when he remarked: “No one, I presume, can analyse the sensations of pleasure or pain” (Darwin 2004, 128). But the expression of pain and pleasure could be described. In the Expression, Darwin, tempering evocative language with scientific reserve, described the instinctive physical response to pain as arising from of the direct action of an excited nervous system. In both humans and in animals, he found that this expression had profound force. In man, as well as in animals that used their voices expressively, pain was frequently expressed by “piercing” cries or groans (Darwin 1872, 69). The effect also surged powerfully through the whole body, expressed in flaring nostrils, quickening respiration and circulation, writhing, fainting and even convulsions. “There is said to be ‘gnashing of teeth’ in hell; and I have plainly heard the grinding of the molar teeth of a cow which was suffering acutely from inflammation of the bowels,” Darwin continued (70). A hippopotamus at the zoo giving birth was reported by an observer to have swayed, rolled and “suffered greatly” (cited in Darwin 1872, p. 70), opening and closing her jaws, and clattering her great teeth.
Prolonged pain, Darwin wrote, could eventually induce depression. But in the first instance, he thought it manifested as a stimulant to action “as we see when we whip a horse, and as is shown by the horrid tortures inflicted in foreign lands on exhausted dray-bullocks, to rouse them” (81). Darwin speculated that animals crying out in pain had initially been an involuntary, purposeless physiological response to nervous stimulus. But this heritable habit of muscular contraction and outcry in had turned out to produce something accidentally advantageous (Darwin 1872, Gray 2014). Calls that were initially instinctive responses could increase an individual’s chance of survival, and so be selected for in populations. Hence, the phenomena of distressed young calling for their parents, “as do the members of the same community call for mutual aid” (72). Darwin also remarked that in humans an “internal consciousness that the power or capacity of the nervous system is limited, will have strengthened ... the tendency to violent action under extreme suffering”. Thus, a sailor about to be flogged might bite on a piece of lead, or martyrs go into a violent paroxysm of religious fervour, because, “As Hippocrates long ago observed, if two pains are felt at the same time, the severer one dulls the other”. Part of the explanation for this, according to Darwin, was a conscious awareness of the fact that “voluntary muscular exertion relieves pain” (73).

By the mid-nineteenth century in Britain, the question of pain, suffering and sentience in animals had become significant in moral and scientific, and political, dimensions (Turner 1980, Desmond 1992, Hamilton 2004a and 2004b, Bourke 2014, Gray 2014). There is a simplistic tendency in some influential accounts in the literature around animal ethics to emphasise Cartesian dualism—explicitly, the idea of animals as ‘machines’ that do not feel pain—as the historical key to understanding practices such as animal experimentation. James Rachels, for example (1990, 131), takes Darwin’s theory of evolution to be “the” reason why “Descartes’s view of animals is not possible today”, suggesting that “between [Descartes] and us came Darwin”, who stressed that “their nervous systems, their
behaviours, are [ours]”. As Preece and Boddice both point out, it is far from the
mark to claim Darwin came out with some radical new theory about the
continuity of the nervous systems of humans and nonhuman animals. Here, he
drew on an extensive body of scientific research and thought. But nor did
scientific debates about the uses or treatment animals in science, medicine or
food production during Darwin’s lifetime hinge on allegiance to, or a defence of,
a simplistic Cartesian dualism. Philosophers had long challenged Descartes’s
views. Locke was a dualist who directly attacked Cartesian mechanism: he
thought animals possessed, although in a lesser degree, faculties of perception,
memory, and had even a very dim capacity to compare simple ideas—they were
certainly not bare machines (Locke 1689/90).

Scientific and medical radicals of the 1830s like the medical educator George
Dermott were— Influenced by Jeremy Bentham and the utilitarian emphasis on
suffering—among those arguing that new zoological knowledge was
strengthening the scientific case against “monstrous cruelties” inflicted in British
slaughterhouses. This was, Dermott thought, “an important Christian lesson”
(quoted in Desmond 1992, 190, my italics). Anatomical schools were also
increasingly rejecting practices that involved the painful dissection of living
animals in physiological demonstrations. During the 1820s, the French
experimental physiologist Francoise Magendie had lectured in London. Magendie
had previously carried out a notorious public demonstration of the physiology of
the nervous system, slicing the back of a live puppy, to expose its spinal nerves.
This kind of practice elicited revulsion not just among the English general public.
Many scientific medical reformers and radicals shared the Scottish anatomist
Robert Knox’s “horror” of what he described as the “aimless probings and
torturings practiced by Magendie and his disciples” (quoted in Desmond 1992, p.
189).

All this occurred in the context of important developments in how the
relationship between mind and body itself was understood, and particularly,
developments in the understanding of the physiology of the nervous system (Clarke and Jacyna 1997; Elwick 2007; Gray 2014; Stanley 2014). Romantic ideas about the unity of nature influenced the nineteenth century’s physiological challenges to older mechanistic and dualistic theories. Long before Darwin published the *Expression*, the physiologist Thomas Laycock (1839) argued that it was “to be regretted that speculations regarding the immortality of the soul are still mixed up with the physiology of mind” (Laycock 1839, 46). It appeared to Laycock that the more philosophical position was to assume that there was an “agency in man (and for any thing we know in other animals) distinct from matter and organization, but dependent on organization for the due display of its effects” (47). Laycock argued for “the truth of the proposition, that the cranial ganglia, although the seat of consciousness and will, are subject to the same laws as those which govern the other ganglia, the diffused nervous system of lower animals ... and the vital mechanism of vegetables”. But with man, Laycock still argued there was “something more”: animals responded to pain and to pleasure, but only man had a “mechanism adapted to the moral world” (70).

Necessarily, the study of the physiology of the nervous system was generating new scientific ideas about phenomena like pain and conscious experience. In the 1830s, the pioneering investigator of the physiology of the nervous system Marshall Hall, cutting a live newt into four pieces and observing that each still moved when its skin was irritated (Elwick 2007), had suggested that nerve signals reflected from limb to spine back to motor nerves, indicating a mechanism by which action could occur independently of both sensation and volition (Stanley 2014). Implicit in this concept was that purposive behaviour could be analysed in units (Elwick 2007). In the 1860s and 1870s, experimental work showed that lesions on the spinal cord could lead to a loss of the sensation of pain (Perl 2007). These kinds of ideas and researches might have led Huxley and others to talk of humans and animals in ways that emphasised the nervous system as operating according to law-bound physical processes susceptible to empirical investigation and requiring no recourse to supernatural explanations,
souls or vague claims about vital forces (Huxley 1868b, Greenwood 2010, Stanley 2014). But they were formulations with little resemblance to Descartes's automata.

There were differing views about the extent to which pain was experienced by other animals. In an item in the Westminster Review of 1863 defending the practice of vivisection as necessary to the extension of knowledge to diminish human suffering, it was claimed that “the sense of pain, even in the most highly organised animals, is very much lower in intensity than it is in man; and ... in many of the lower creatures, it can scarcely exist at all” (Westminster Review 1863, collected in Hamilton 2004b). This might sound like a suspiciously convenient dodge to defend a morally dubious practice—but my point in quoting it here is to show that the defence of medical and scientific experimentation on animals did not by any means consist in a Malebranche-style dualist denial that animals could suffer or feel pain at all.

In November 1875, Darwin told the British Royal Commission on Vivisection of his conviction that the progress of scientific knowledge would be impeded by an outright ban on the practice of experimentation on living animals. In his words:

> I am fully convinced that physiology can progress only by the aid of experiments on living animals. I cannot think of any one step which has been made in physiology without that aid (British Royal Commission 1876, 234).

Darwin also told the commission he supported the 1871 resolution of the British Association for the Advancement of Science that experiments on animals ought not be conducted without anaesthetic (where that option existed), and that no painful experimentation was justified purely for the purposes of teaching or physiological instruction. Again, this was a common enough view, frequently expressed in pro-vivisection writings of the time (Hamilton 2004b). But neither the British Association nor Darwin went so far as to say painful experimentation should never occur. Instead, they urged any painful experiment ought to be
undertaken only in the context of well-designed experiments likely to add to scientific knowledge, in order that “the suffering inflicted may not be wasted” (British Association 1871, 144).

Darwin told the Royal Commission that “many reasons, mostly general, but some special may be assigned for a full conviction that hereafter physiology cannot fail to confer the highest benefits on mankind” (British Royal Commission 1876, 234). This interest was evidently, from Darwin’s perspective, a weightier moral consideration than any suffering or deprivation that might be experienced by animals in the research process, although Darwin did concur that experimenting on live animals without appropriate pain relief would be abhorrent. But where the animal was insensible Darwin remarked, “I can understand a Hindoo, who would object to an animal being slaughtered for food, disapproving of such experiments, but it is absolutely unintelligible to me on what ground the objection is made in this country” (234). Here, Darwin framed the question not just in cultural terms—but in the specific terms of a culture taking its ethical cues not from superstition or inherited metaphysical systems, but from the secular principle of scientific progress as a necessary tool of moral and practical advancement.

Huxley is generally perceived as expressing a more strident and unapologetic commitment to vivisection. James Turner, riffing on a familiar theme, calls him “vivisection’s bulldog” (1980, 101). And indeed, Huxley had been attacked, while president of the British Association, for his defence of experimental physiologists like who had undertaken experiments on living animals (L. Huxley 1900). But his defence of the practice, like Darwin’s, rested on the claim that the total elimination of experiments on living animals would arrest the progress of science. To be sure, he expressed it with his typical realpolitik, telling a correspondent that one effect of banning the practice of vivisection outright in Britain would likely be that young physiologists would simply head off to France and Germany—where, it was implied, the prospects for animals in the experiment lab
would be rather more dim: “I doubt if such a result will contribute to the diminution of animal suffering” (Letter to Sir W. Harcourt (n.d.), *Life and Letters Volume I*, p. 435).

At the height of the political controversy over vivisection in the 1870s, Lord Shaftesbury, a noted opponent of the practice, had written to the London Times claiming that Huxley’s *Lessons in Elementary Physiology* promoted the idea that children should undertake their physiological education and instruction by the dissection of *live* animals. An exasperated Huxley complained of being misrepresented (Shaftesbury would himself politely concede this). Huxley had this to say about vivisection, in a letter to John Donnelly: “The performance of experiments upon living and conscious animals is extremely disagreeable to me, and I have never followed any line of experiment in which such experiments are required” (Letter to Sir John Donnelly, 1876, n.d., *Life and Letters Volume I*, 431). But he refused to “consent to be prohibited from showing the circulation in a frog’s foot because the frog is made slightly uncomfortable by being tied up for that purpose” (431–32). Nor would he be dissuaded from

... showing the fundamental properties of nerves, because extirpating the brain of the same animal inflicts one-thousandth part of the prolonged suffering which it undergoes when it makes its natural exit from the world by being slowly forced down the throat of a duck, and crushed and asphyxiated in that creature’s stomach (432).

He was, he wrote to a theology student inquiring on his views, not disposed to be a “sentimental” hypocrite in a world where all things inevitably suffered but humanity “imperatively demanded” the kind of knowledge that might alleviate that suffering.

For the advantage and protection of society, we all agree to inflict pain upon man—pain of the most prolonged and acute character—in our prisons and our battlefields ... The wanton infliction of pain on man or beast is a crime; pity it is that so many of those who (as I think rightly) hold this view, seem to
forget that the criminality lies in the wantonness, and not in the act of inflicting pain per se (Letter to unnamed correspondent, September 29 1890, *Life and Letters* Volume 1, 435–6).

Huxley’s language may have been blunter. But for Darwin, too, the interests of human animals equally took precedence over those of nonhuman animals, where those interests came into conflict with the goal of furthering humankind’s knowledge of nature.

**6.3 (x) degrees of separation**

Darwin was no part of a growing vegetarian movement in England in the second half of the nineteenth century (Gregory 2007), notwithstanding that he makes an occasional ambiguous appearance on lists of famous figures supposed to be linked with the vegetarian movement. Alfred Russel Wallace appears to have in principle endorsed, though not always strictly followed, a vegetarian diet (‘A.D.’ 1898, 121). But Wallace viewed vegetarianism favourably—for environmental and health reasons, as well as from an aversion to the violence of butchery (Wallace 1916, 158). Huxley, as has been previously noted, lumped vegetarianism in with other symptoms of a fanatical and sentimental temperament (Huxley [1887] 2005, 123). And Engels (with a cursory apology to vegetarians) argued that the eating of meat “in a race of apes that far surpassed all others in intelligence and adaptability” (Engels 1941, 286) drove brain development and was crucial to the course of human evolution. Man “did not come into existence without a flesh diet,” Engels wrote in the unfinished manuscript later published as ‘The Part Played by Labour in the Transition from Ape to Man’, adding unsentimentally that “if the latter, among all peoples known to us, has led to cannibalism at some time or another … that is of no consequence to us to-day”.  

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30 He has, as it happens, been vindicated to an extent by paleoanthropological evidence that meat consumption was indeed highly significant in the evolution of human cultures and societies—see e.g. Smil 2013—although that is not my topic here.
Notwithstanding, websites dealing with the history, philosophy or political practice of vegetarianism often feature one Darwin’s more famous statements from the *Descent of Man*:

> Nevertheless the difference in mind between man and the higher animals, great as it is, is certainly one of degree, and not of kind (2004, 151).

This “nevertheless”—which I’ve italicised here—is generally absent when this quote appears. It is, however, significant. Differences in degree may, after all, be smaller or larger in that degree, and it is easy, without additional context, to miss this important pointer to the fact that Darwin believed that the *degree* of difference between humans and nonhuman animals was, on some measures, considerable.

Difference in *kind*, of course, would mean things incommensurable. In the chapter prior to his exploration of the mental powers of animals in the *Descent* Darwin had outlined his evidence for the evolutionary continuity of the laws and processes governing the physiological structure and development of humans and nonhuman animals. To complete this picture, he needed to show that there was no difference between the mental powers of humans and those of animals of such a nature that would mean it was it logically impossible for man to have descended, modified by the processes of natural selection, from “some lower form” of animal (Darwin 2004, 85). Robert J. Richards (1987) is, I think, correct to identify as crucially significant the fact that Darwin’s explanation of the gradual development of the human moral sentiments from social instincts that could be readily observed in animals was one that did not require unnatural saltations or dubious leaps to explain humans. Thus, there was no loophole to suggest divine interference or explanations such as souls might be needed. Making this point was, indeed, the very purpose of the *Descent* and the *Expression*. But in highlighting this purpose, Richards also alerts us to why, in these works, Darwin had an exceptional reason to dwell on and to *emphasise*
continuity in mental and moral development, downplay difference, and impress this upon his readers, because the plausibility of his argument depended on it.

In the early-and-mid-nineteenth century, even medical men of radical intellectual stripe such as George Dermott had not fully dispensed with soul. Arguing for a material basis for mind, Dermott also insisted that humans (and possibly, other animals) possessed an immaterial soul, although it was radically unknowable, and would reveal its true nature only after death (Dermott 1830). Carpenter, whose physiological researches influenced Huxley’s scientific views, also maintained a role for a discrete human soul (Clarke and Jacyna 1997, Stanley 2014). Darwin’s had nothing to say of souls—but he certainly did not try to argue that the moral capabilities and cognitive endowments of humans blurred with no remarkable or notable distinctiveness into those of any presently extant common ancestor. On the contrary, “there can be no doubt,” Darwin had written in the passage immediately preceding that famous quote above, “that the difference between the mind of the lowest man and that of the highest animal is immense” (2004, 150). An “anthropomorphous ape” wrote Darwin, could not “follow out a train of metaphysical reasoning, or solve a mathematical problem, or reflect on God, or admire a grand natural scene” (150). An ape, “if he could take a dispassionate view of his own case” (150) would also “be forced to acknowledge that disinterested love for all living creatures, the most noble attribute of man, was quite beyond their comprehension” (151). In the Descent, Darwin concluded that no animal other than man was self-conscious, were that term to be taken to mean that it reflects, amongst other things, on “whence he comes ... or what is life and death” (105). He stressed, however, that this kind of self-consciousness—even if, like the capacity for moral reflection, it was singularly an endowment of the human species—could still have arisen naturally, gradually and incidentally, via (as Darwin proposed) the continued use of language.

Authors including Singer, Rachels and Ryder have based arguments about our moral responsibilities towards animals on an appeal to Darwin’s case for
evolutionary continuity. Rachels argues that while there are clearly differences between humans and the diverse variety of other species, the issue at stake is whether these differences are morally relevant. Darwin is also claimed by Rachels to have “resisted the idea that humans have characteristics that are not shared by other animals” (Rachels 1990, 185).

It is useful here to digress briefly on some recent debates in comparative theory of mind. This digression is simply to remind us why it’s important to bear in mind the potential diversity of psychological and cognitive architectures across the animal kingdom (Barrett 2008). The late American zoologist and seminal researcher of animal behaviour Donald Griffin is well known for his insistence that animals have conscious mentality. But Griffin also cautioned (Griffin 1999) that evolutionary continuity is not identity. Penn, Holyoak and Povinelli (2008) have argued that in the last two decades of the twentieth century, comparative psychologists have predominantly tended to emphasise similarities between human and nonhuman minds. This has also been the emphasis of many moral philosophers, notably Rachels.

Penn, Holyoak and Povinelli have argued for discontinuities between human and nonhuman minds—particularly, in the extent to which nonhuman animals can approximate higher order and systematic relational capabilities (the kind of capability that allows humans to devise and read maps, diagnose another’s illness, or process recursive mental operations over hierarchical relations). Their claim is that only humans are able to “reason about higher-order relations in a structurally systematic and inferentially productive fashion”, albeit that this difference must have evolved through incremental Darwinian processes (Penn, Holyoak and Povinelli 2008, 128). Not all would fully acquiesce to this interpretation (Suddendorf 2013; Tomasello 2014). Penn and Povinelli suggest (2013) that the key to resolving these sorts of disagreements is to develop novel theoretical approaches to investigating cognition to get beyond old dichotomies. I raise these discussions here simply to show that it is important that the concept
of evolutionary continuity (and particularly as Darwin formulated it in the *Descent of Man* and the *Expression of the Emotions*) does not mislead to be unreceptive to potential *diversity* of animals’ psychological mechanisms. For many kinds of species—particularly those less phylogenetically close to humans—it is a complex exercise to penetrate the mysteries of mental experience.  

Corvid researchers Nathan Emery and Nicola Clayton (2008, 134) point out that it is claimed *differences* between humans and other species that are the most impervious to identification and quantification because experimenters rely heavily on human-biased methods like language. For Louise Barrett (2008, 130) the importance of these debates is that they at least draw us away from the “evolutionarily impoverished view that other species’ cognition will merely represent some or other variant of our own” (130).

When thinking of Darwin’s own use of the term *degree* in historical context, we also need to look back to David Hume’s account of human understanding (Huntley 1978, Richards 1987). Darwin, in his ‘N’ notebook, jotted: “Hume has section […] on the Reason of animals [...] I suspect the endless round of doubts & scepticisms might be solved by considering the origin of reason. as gradually developed. see Hume on Sceptical Philosophy” (N101, 591–2). Huntley (1978) shows Darwin had certainly been reading Hume during his notebooks period and also notes Hume’s influence on Erasmus Darwin. In the *Zoonomia*, Erasmus Darwin explicitly rejected Locke’s theory of ideas in favour of Hume’s and Berkeley’s more fundamental and sceptical empiricism (E. Darwin, 1794).

The *Treatise on Human Nature* opens with Hume’s claim that the difference between “what I shall call IMPRESSIONS and IDEAS” is only “the degrees of force and liveliness with which they strike upon the mind, and make their way into our thought or consciousness” (Hume 1955, 1). In the *Treatise*, Hume would argue that since animals provided an anatomical model that extended our knowledge of human anatomy on the principle of structural analogy, it was logical to extend

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31 Thomas Nagel famously argued that philosophically, one could never ‘know’ the mind of another species.
this analogy to animals’ minds. Animals, Hume argued, experienced pride and humility caused by passions “likewise much the same in beasts as in us” (326). Hume also thought animals also reasoned in a limited form, because they exhibited behaviours strongly suggesting that they drew inference from experience. Since animals could be readily and regularly observed to change their behaviours apparently in accordance with new circumstances, the obvious implication was that they had the capacity to learn from observation, rather than just act mechanically.

Richards (1987) has remarked on the resonance between Hume’s associationist psychology and Darwin’s account of thinking as he pondered transmutation in his 1830s notebooks. Hume scholar Terence Penelhum (1993) has also remarked that Hume’s epistemology of belief more broadly shares characteristics with the theory Darwin would develop. Hume starts from the idea that our instincts invest our perceptions with practically useful and adaptive meanings. Importantly, there is a sceptical limit placed around this, and “[Hume] never says the lifeworld our instincts create for us is one we know to be the true one” (124).

In his M and N notebooks, Darwin at a number of points describes thought as a process initially beginning with sensation, and describes memory as then being built from a process of these associations, with association itself initially “probably a physical effect of brain” (M46, 530). “Do not our necessary notions follow as consequences on habitual or instinctive assent to propositions, which are the result of our senses or our experience” (N16, 568). Later in the same notebook: “—reason probably mere consequence of vividness and multiplicity of things remembered & the associated pleasure &c accompanying such memory” (N21e, 569). Darwin also considered “free will”—allowing that oysters and puppies alike may be said to possess this “direct effect of organization, by the capacities its senses give it of pain or pleasure”:

..if so free will is to mind, what chance is to matter ... the free will (if so called) makes change in bodily organization of oyster. so may free will make change
Darwin never drew appreciably strident or radical conclusions about the treatment or moral status of animals from his theory of descent with modification and the evidence for evolutionary continuity between humans and other species. Nor had Hume drawn notably radical ideas from his own observations, beyond a general hint in his *Enquiry Concerning the Principles of Morals* (1751). Here, he wrote that were there species of creature intermingled with men which “though rational, were possessed of such inferior strength, both of body and mind, that they were incapable of all resistance and could never, upon the highest provocation, make us feel the effects of their resentment” we might be bound to treat them gently. But we would not be bound not to include such creatures in the sphere of justice (Hume 2004, 23).

Darwin’s position, though, does seem noteworthy given that by the later nineteenth century, there was a well-developed, morally respectable and politically influential anti-cruelty movement in Victorian England, to which he could readily have lent his household name had he been inclined. Singer, as we shall shortly see, concluded in *Animal Liberation* (1975) that the explanation as to why Darwin did not advocate for the need for a radical reconsideration of our manner of treating nonhuman animals in the light of his own theory lay in the ideological power of the status quo attitudes. I think the matter is more morally challenging and complicated than Singer’s explanation implies.

Darwin never made a comprehensive attempt to explain or systematise his thoughts on how his theory of common ancestry might specifically relate to the treatment of nonhuman animals. One plausible explanation for Darwin’s disinclination to do so has the benefit of being parsimonious, and not requiring too much psychological or sociological speculation. I suggest that the philosophical and metaphysical commitments and motivations of the Victorian anti-cruelty movement and its champions were actually quite different—and in
kind, not just in degree—from the sorts of conclusions about the world that Darwin drew from his own scientific naturalism.

When a curious correspondent sought Darwin’s view on vegetarianism, noting (not quite accurately as we now know) that the anthropoid apes are vegetarian, Darwin wrote back in a short letter that he had not given the question “much thought” (Darwin 1880, cited in Van Whye 2009, 428). Darwin added that the only scientific evidence that might be relevant to the question would be “the statistics in regard to the amount of labor performed in countries where the population lived on a different diet”. While that evidence was lacking, Darwin did point out the miners he had encountered in Chile—the most “extraordinary workers” he had ever seen—lived on an exclusively vegetarian diet. The Brazilian gauchos, on the other hand—a people whose robustness and vigour Darwin admired greatly—“live almost entirely on flesh”. Among the people of Africa, Darwin continued, “an extraordinary craving exists, which increases to a necessity at times, to eat flesh” (428). What is revealing about this response is that Darwin offered no moral opinion or ethical speculation about the treatment or killing of animals, or of eating flesh in principle, providing only a comment about the principles by which one would judge the advantages of different sorts of human diets in the context of the their environment.

Darwin, in the Descent, at least thought that “humanity to the lower animals seems to be one of the latest moral acquisitions” and assumed the forces of social instruction would lead to this becoming a widespread “virtue … honoured and practiced by men” (2004, 147). It is noteworthy, though, that Darwin here says nothing of what that humanity or diffused sympathy might amount to in content or in practice—he does not try to draw any specific ethical obligations from this observation. I hope to shed some light on one possible explanation for this in my discussion about Darwinian naturalism and suffering.
6.4 The concept of “speciesism”

Darwin’s own views and practices and any explanation for them notwithstanding, a number of philosophers have maintained that if humans are, like all animals, the products of descent with modification from common ancestors, this logically entails we should radically re-conceptualise our relationship to, and our treatment of, nonhuman animals (for a succinct summary of the philosophical claims, albeit from a somewhat hostile witness, see Kaufman 2013). Singer, Steiner, and Rachels and the cognitive scientist Marc Bekoff are all among those who have argued for this view. The term speciesism comes to us via Ryder, campaigning against medical experimentation on animals in the 1970s. Ryder’s original formulation begins right up-front with moral obligations said to flow from Darwin, and it is worth quoting at length here, as it is considered a founding document in a philosophical movement built around the term he coined.

Since Darwin, scientists have agreed that there is no ‘magical’ essential difference between human and other animals, biologically-speaking. Why then do we make an almost total distinction morally? If all organisms are on one physical continuum, then we should also be on the same moral continuum. The word ‘species’, like the word ‘race’, is not precisely definable. Lions and tigers can interbreed. Under special laboratory conditions it may soon prove possible to mate a gorilla with a professor of biology—will the hairy offspring be kept in a cage or a cradle? It is customary to describe Neanderthal Man as a separate species from ourselves ... Suppose that the elusive Abominable Snowman, when caught, turns out to be the last survivor of this Neanderthal species, would we give him a seat at the UN or would we implant electrodes in his super-human brain? ... If we believe it is wrong to inflict suffering upon innocent human animals then it is only logical, phylogenically-speaking, to extend our concern about elementary rights to the nonhuman animals as well (‘Speciesism’, pamphlet quoted in Ryder 2011, 51).
For Ryder, the point was that from biological continuity flowed moral rights (as shown by the unlikely but rhetorically arresting example related to the moral status of the offspring of gorilla and biology professor—perhaps a dig at Huxley?).

Singer is recognised as giving the term “speciesism” more widespread currency. In *Animal Liberation* (1975), however, Singer did not initially formulate this concept with any explicit reference to or claim about Darwin. Rather, he rested his claim that allowing nonhuman animals to be treated in ways that we do not treat members of the human species (such as killing them for food or experimenting on them without consent) ought to stand condemned as speciesist on a straightforward analogy with racism and sexism, drawing on the principles of utilitarianism. Singer’s argument here depends on two claims: (1) it is morally unacceptable to cause or condone suffering where it could be avoided; and (2) the principle of equality—“no matter what the nature of the being, the principle of equality requires that its suffering be counted equally with the like suffering—insofar as rough comparisons can be made—of any other being” ([1975] 2009, 8).

But in a survey of the philosophical history of what he calls the speciesist bias in Western culture, which appears later in *Animal Liberation*, Singer does relate his argument directly to Darwin, criticising him for retaining “the moral attitudes to animals of earlier generations, though he had demolished the intellectual foundations of those attitudes”.

[Darwin] continued to dine on the flesh of those beings who, he had said, were capable of love, memory, curiosity, reason and sympathy for each other; and he refused to sign a petition urging the RSPCA to press for legislative control of experiments on animals. His followers went out of their way to emphasize that although we were a part of nature and descended from animals, our status had not been altered (211).

Singer here applies a form of argument that Guy Kahane (2011, 108) calls a historical debunking argument. The idea underpinning this kind of argument is
that we should treat the foundations of our beliefs as suspect if those foundations are shown to include “influences such as the residue of arbitrary cultural conventions” (109), or mistaken beliefs. Here, Singer applies Darwin’s scientific ideas to debunk the historical foundations of Darwin’s own moral practice.

Singer also includes Darwin’s “followers” in his criticism. He specifically names, Huxley, who in Man’s Place, had written of his belief in the “vastness of the gulf between civilized man and the brutes” (Huxley [1863b] 2001, 112). And it is certainly true that Huxley denied (possibly with one eye on his audience’s prejudices) that human dignity was undermined by common ancestry.

Our reverence for the nobility of manhood will not be lessened by the knowledge that man is, in substance and structure, one with the brutes (114).

Singer reads all of this as evidence of “the ideological nature of our justification of the use of animals” (211)—“the moral attitudes of the past were too deeply embedded in our thought and our practices to be upset by a mere change in our knowledge of ourselves and of other animals” (212). On his reading, both Darwin and Huxley must surely acknowledge that the foundations for the traditional kinds of distinction drawn between humans and “brutes” have been “demolished” by their scientific beliefs, yet they continue to make practical moral distinctions between human and nonhuman animals. They continue to endorse or to implicitly sanction practices that put the interests of humans before animals and cause suffering, and they do not challenge the cultural conventions that deny animals full moral consideration of their interests.

“It is a distinctive characteristic of an ideology that it resists refutation,” as Singer puts it.

If the foundations of an ideological position are knocked out from under it, new foundations will be found, or else the ideological position will just hang
there, defying the logical equivalent of the laws of gravity. In the case of attitudes to animals, it is the latter that seems to have happened (2011).

This is an unequivocal claim: Darwin is said to destroy the foundations for the “old reasons” (2011) for assuming there are morally relevant differences between animals and humans with the same kind of certainty that Newton’s mathematics gave to the existence of gravitational force. With regard to certain kinds of metaphysical assumptions or appeals to the concept that humans are the products of a special or separate act of creation, we can perhaps assess Singer’s claim to be fair. Singer has, however, made a second strong claim that has a rather different basis: that Darwin and Huxley should have interpreted the theory of common ancestry—a theory, we must remind ourselves, in natural science, not in metaphysics or ethics—as logically requiring we should change our historical practices in relation to the treatment of animals. That they did not, he takes as evidence of the ideological power of past attitudes.

Singer draws attention to one particular characteristic of an ideology: that it resists refutation. His manner of arguing—although Singer doesn’t say as much—therefore brings to mind a Marxist conception of ideology as the distorting effect of the social and political narratives of a dominant regime. True states of affairs, on this reading, can be appreciated only once we are able to see past the distorting effects of social and historical beliefs. The suggestion is, then, that the conclusions about the moral status of animals that Singer draws from Darwin’s theory of common ancestry are what would be revealed as the true and correct ones had we such untainted vision. Richards (1993) notes that that ideology is frequently obscure to us as ideology. But he also points out that the very meaning of the concept hinges on a presumption: that some ideas can escape “the kind of distortion which others suffer” (1993, 103), and that a clear distinction can be made between true (or at least rationally sound) and false ideas. Singer’s argument depends on just such a presumption.
6.5 On suffering

*Animal Liberation*’s foundational arguments for radically altering our treatment of animals are utilitarian arguments directed against suffering. It is to this topic I now want to turn. Suffering is of course, no straightforward concept. It appears to have a rough commonsense meaning of course, but on examination, this can have physiological, psychological or philosophical dimensions, frequently overlapping or used interchangeably with emotional concepts like grief, loss, and despair. Sometimes (as it is often applied in relation to the discussion of nonhuman species in science) the term is used in a relatively narrow sense to describe the physiological effects of pain, stress or deprivation. In what follows, I will have cause to consider the term in several senses.

That many organisms inevitably experience pain or deprivation in the course of their existence and death is an unavoidably present fact in Darwin’s writings and thought. Physiologically, Darwin had no doubt that many kinds of animals experienced and expressed what could be interpreted as pain and suffering—although he was careful to avoid speculating on the quality or nature of the subjective experience of pain, setting it aside as outside of the bounds of analysis by empirical science (Darwin 2004, 128). Singer’s argument in *Animal Liberation* rests on the claim that inflicting suffering or allowing it to continue where it is avoidable is a moral evil—a point with a long and admirable historical pedigree, but one that does not require, and which Singer does not derive from, a Darwinian scientific theory of common ancestry. The utilitarian premise of Singer’s claim is that if an entity can suffer, this accords it a basic interest—it has an interest in *not* suffering which is equivalent whether that entity is a human or of another species. Ryder (2011) has recently come at this matter from a slightly different perspective, emphasising the more specific concept of pain. Because we know that other species, like humans, can experience pain, we have a common purpose—he calls it a “community” (Ryder 2011, 60)—in avoiding it, with other “painient” creatures.
Darwin’s discussion of pain in the *Expression* offered an evolutionary explanation for the emotionally compelling effect of cries or expressions of pain or suffering in others—and crucially, humans were also emotionally sensitive to these expressions in nonhuman species. Darwin’s explanation emphasised that an initially physiological response to pain had been selected because it was advantageous. In proffering this kind of naturalistic account of our powerful sympathy for or revulsion to, suffering or pain, and emphasising pain as evolving from an initially physiological response, Darwin was implicitly doing something else—stripping the power of other ways of accounting for pain and suffering that had recourse to absolute and external metaphysical moral principles such as the idea that pain is bad, or that suffering is morally improving. With Darwin’s account of natural selection, these explanations became redundant.

This kind of implication has made a variety of philosophers uneasy about Darwin’s ideas. Indeed, far from taking from Darwin’s explanatory framework for evolution the message that humans should *minimise* the suffering on the basis of our “community of descent”, many philosophers and thinkers have felt a profound moral discomfort with, if not revulsion for, Darwin’s ideas for precisely the opposite reason. They have feared that the theory of natural selection legitimises or even endorses the infliction of suffering. Or, as Thomas Suddendorf (2013) points out, they have worried that a Darwinian perspective suggests that humans and all other animals should be inherently selfish, and indifferent to the interests of others—and as we shall come to, some in the nineteenth century did indeed take something close to this view. Rob Boddice even seems to endorse this as a reasonable kind reading when he remarks that Darwin’s conception of the struggle for existence in nature “*naturally* placed this variety above that” and implied that “man, at the top of the natural chain, acts as an analogy of nature” (318, author’s italics). I would treat with even greater caution Boddice’s subsequent remark that “Darwinism seems to imply that man must extinguish varieties that do not adequately serve him” (Boddice 318).
There is no doubt that many did read into Darwin’s ideas these kinds of implications—and said as much. The physiologist and prominent lecturer Michael Foster was one, defending vivisection with the claim that

Mr. Darwin has shown us that ... Man's life is a struggle for existence with his fellow-men, with living animals and plants, and with the lifeless forces of the universe. The very conditions of his existence lay upon him the burden, and in doing so, give him the right, to use the world around him, the lives of animals included, to aid him in his strife (Foster 1872, 368).

We live, wrote Foster, in a “selfish world”.

But there were other ways to read the implications of evolutionary common ancestry. Some nineteenth-century writers explicitly rejected Foster’s kind of claim. In 1894, writing on the ethical basis for humanity to animals, an American doctor, Albert Leffingwell, used an evolutionary appeal to common ancestry combined with a call for humility about the limits of science to argue that we should not “fry living crabs, or roast live lobsters”. Since science suggested that animals were kin, but scientists could not do more than “guess” at whether or how these kin experienced pain, it was ethically prudent not to subject them to a death by fire:

You tell me ... such creatures do not feel pain very acutely; but how do you know? In their place, would you take the chance? (Leffingwell 1894, 480)

Singer has unconvincingly sidelined the complexity and plurality of nineteenth-century readings of the moral implications of Darwinism, offering a simplistic account of a battle between correct and incorrect (read, right-wing) interpretations of Darwin’s ideas. His argument in A Darwinian Left that nineteenth-century thinkers on the left—bar the “one great exception” of Kropotkin—“accepted the ‘nature red in tooth and claw’ view of the struggle for
existence” (1999, 19) and got Darwin “wrong” surely bowdlerises complex issues to advance a narrow view.

The idea that the fact of suffering has objective moral content (is objectively bad) is an example of the kind of belief notoriously intractable to justification by reference to any independent evaluative principle (Kahane 2011), the indubitable power of our revulsion to it (under some circumstances, anyway) notwithstanding. And as I have suggested above, a plausible argument about the evolutionary origins of emotional sympathy would seem to make such a justification a more difficult ask. It is also hard, however, to escape the everyday observation that with regard to our human sensibilities and subjective experience—to briefly personify nature for the purposes of my point—the indifference of nature to the suffering of the living beings that are its products instinctively seems to support the commonplace that nature is, or at least can be, cruel. It might follow that we have a rational interest in avoiding suffering.

Yet interest-based arguments don’t fare well in the face of plausible naturalistic explanations for the existence of suffering either, since it is not obvious how—even if one wanted to—it would be possible for any living thing to avoid circumstances in which its own biologically originating needs, instincts and desires come fundamentally, inescapably, and violently into conflict with those of other living things. “Even vegetarians and vegans,” Suddendorf comments, “can only restrict which organisms they choose to eat, not whether to eat any” (2013, 189).

Darwin clearly felt the need to be on the defensive about his own emphasis on the evolutionary role of struggle and suffering in nature. In the famous last paragraph of the chapter on the ‘Struggle for Existence’ in the Origin of Species, for example, Darwin urges that “we may console ourselves with the full belief that, the war of nature is not incessant, that no fear is felt, that death is generally prompt, and that the vigorous, the healthy and the happy survive and multiply”
(Darwin 1859, 79). This demurral has hardly convinced all his readers (whether his adherents or his opponents) that Darwin himself placed great faith in that “consolation”. Certainly it follows several pages of argument in which Darwin has described nature as a scene of “competitors” and “enemies” (78), “heavy destruction ... [of] the young or the old” (66), “severe” competition in which species supplanted each other (76), and a battle of life in which the insectivorous singing birds that so lift the nature watcher’s spirits are actually “constantly destroying life” while themselves threatened being “destroyed by birds and beasts of prey” (62). His “consoling” paragraph might have been a genuine attempt to ameliorate the apparent harshness of the struggle for survival, or it might have been part of a more shrewd rhetoric that aimed to engage the sympathies of readers under the sway of a Romantic imagination of nature (Davies 2009)—but there can be no doubt that the Origin naturalised suffering in nature, and in a highly original way.

The existence of suffering had, of course, been a perennially vexed issue for philosophers of all stripes. Theologians had wrestled with it for centuries, inventing ingenious devices to explain away evil as a necessary part in god’s plan, and to neutralise the potentially corrosive message in an obvious moral paradox—the fact that even those living beings supposed to be incapable of moral evil (such as little children or animals) could and did suffer (Lovejoy, 1936). Darwin not only gave suffering a naturalistic and objective explanation, he made it an indispensable element of his theory of descent, weaving it in to the story of our evolutionary origins as its sine qua non. Suffering was inseparable from the story of how things got to become other things—and how humans got to be human. Furthermore, all living things—by definition, on this account—both suffered, and meted out suffering. This stark accusation from the pages of the Origin surely resonated without needing to be stated in such blunt terms: all living things compete and kill in order that they may live at all. We are in fact a product of suffering in the natural world.
Huxley, as I have outlined in previous chapters, likewise saw suffering in nature as inevitable. For Huxley, it was the price paid for being sentient and alive at all. This was the foundational claim, in fact, of his ethical perspective. All living things suffered, but human beings, Huxley argued, additionally and singularly afflicted with “the malady of thought” (Huxley 1935, 224), suffered in a way that other kinds of animals did not. Human consciousness brought with it the burden of a qualitatively different sort of pain.

Suppose, for argument’s sake, that all mammals and birds are subjects of pleasure and pain. Then we may be certain that these forms of consciousness were in existence at the beginning of the Mesozoic epoch. From that time forth, pleasure has been distributed without reference to merit, and pain inflicted without reference to demerit, throughout all but a mere fraction of the higher animals … the amount and the severity of the pain, no less than the variety and acuteness of the pleasure, have increased with every advance in the scale of evolution. As suffering came into the world, not in consequence of a fall, but of a rise, in the scale of being, so every further rise has brought more suffering (Huxley 1892, 33).

But only humans could gaze over the side of a boat at sea, and pursue a line of thought that led from the dance of light on the water to a melancholy reflection on temporality and so on to imagine their own inevitable personal annihilation—that moment they might be swallowed forever by the vast darkness of eternity. Freud was another who felt this kind of suffering intensely, and in consequence made death a centerpiece of his theory of human psychology, and an object of obscure desire. In a similar vein, the comparative psychologist David Premack had once wondered whether it might be possible to transmit the concept of personal death to chimpanzees, but concluded it would be morally unacceptable to try, lest the animals come to “dread death” and “deal with this knowledge as bizarrely we have” (Premack 1976, 674). Humans suffered, for Huxley, in another way, too. Being the imperfect accidents of natural laws, the human senses were liable to deceive, while at the same time, he perceived humans as psychologically prone to illusions, self-deceit, and epistemic over-reach.
Although Darwin in his autobiographical *Recollections* (published posthumously) stated that, by and large, pleasure outweighed pain and suffering in nature, he calmly added that “such suffering, is quite compatible with the belief in Natural Selection, which is not perfect in action, but tends only to render each species as successful as possible in the battle for life with other species in wonderfully complex and changing circumstances” (Darwin [1887] 2002, 52). Davies (2014), in an examination of Darwin’s rhetorical strategies in the *Origin*, argues against being misled by Darwin’s own language to the conclusion that Darwin was presenting a Romantic view of nature: he knew, argues Davies, that the “relentless drive to produce more life in a world of finite resources and hostile conditions is, of necessity, a deeply destructive drive” (2009, 13). But while one might readily intellectually assent to this, “having a stomach for the actual facts involved is much harder” (13).

Davies suggests that Darwin, deeply wise to the frailties of human psychology and particularly sensitive to our exquisitely tuned capacity to deceive ourselves, anticipated that it would be our limited psychological imagination that would ultimately render readers resistant to his theory. So he wrote the *Origin* with this in mind, argues Davies. In his chapter on ‘The Struggle for Existence’, for example, Darwin remarks that “nothing is easier to admit in words” than the universal struggle for life. But he added that nothing is “more difficult” (1859, 62) to constantly bear in mind.

Yet unless it be thoroughly engrained in the mind, I am convinced that the whole economy of nature, with every fact on distribution, rarity, abundance, extinction and variation, will be dimly seen or quite misunderstood. (Darwin 1859, 62)

Davies says Darwin’s implicit textual strategy is to appeal to the affective dispositions and conflicts within the architecture of our psychological constitution—dispositions that he knew would retard readers’ ability to make the
cognitive leap enabling them to see the world from this new point of view. Davies thinks that there were two crucial “deficits” in his readers’ psychological makeup (17) that Darwin was alert to in the *Origin*. Darwin, says Davies, recognised that the Romantic zeal for imagination and heightened aesthetic sensibility could seduce people to see purpose, or patterns or artistry in nature where there is in fact none. This is reinforced to an extent by a second problem—that humans tend not to notice conflicts within our minds. We often accommodate and tolerate what may even be mutually exclusive kinds of ideas.

Davies argues that Darwin wrote the *Origin* the way he did—soothingly conversational in tone, frequently Romantic in idiom—because he had the insight to see that the one thing that would not have the power to convert the majority of his readers to his radical perspective on nature all on its own would be unadorned facts. The argument would be resisted, and the explanation for the resistance would reside in the human psychology that was itself a product of a contingent evolutionary process. So Darwin needed to frame his argument in a manner that could anticipate those points of psychological resistance, and bring his readers through them. Certainly, Davies’s interpretation takes Darwin to be a shrewd rhetorician indeed. But I am persuaded that Davies at the very least succeeds in showing that Darwin deeply understood the psychology of his likely middle-class Victorian readers, steeped in a Romantic view of nature and used to accommodating conflict with philosophical ingenuity—he was after all in so many ways, that readership. Indeed, Alan Gross has argued that one can interpret textual clues in the grammar and structure of Darwin’s Red Notebook as evidence of an internal conversation, as the young Darwin himself grappled privately with, resisted, and then finally was persuaded by, the implications of his own researches and speculations.

*The Origin of Species* evolves in two phases: it begins with a rhetorical transaction with the self, and ends in a rhetorical transaction with others (Gross 2006, 97).
There is other evidence that seems to validate Davies’s general line of thought. Darwin’s letters, for example, show him to be a reserved and careful respondent, particularly to the numerous unknown correspondents who sought to draw out his views about the implications of his theory on matters from Biblical literalism to vegetarianism. The closer you get to those places Darwin did not anticipate a public or wide audience (letters to friends, and in particular his private notes), characteristically, the less his caution.

In the twentieth century, George C. Williams would write suffering into organic nature in a decidedly un-Romantic modern way (Williams 1989). The “nature” Williams had in mind was not a grand cosmic process, but the biological evolutionary process boiled down to competition for selection between alternative alleles. We should take this nature as a warning, Williams suggested, and be vigilant against our powerful genetic tendencies. (What other animal, after all, has developed nuclear bombs? Edward O. Wilson (1978) thought that if hamadryas baboons had, they would have obliterated the world within days). Williams records his litany of charges against nature with dramatic examples from the literature of evolutionary biology. Rape, parasitism, murder, deception, adultery, incest—just about everything that is considered by humans to be shocking or unethical—is a matter of fact in a biological world built on the indifferent logic of the successful propagation of genes. I have argued in a previous chapter that Williams’s claims about biological nature are not of a kind with Huxley’s ethical argument from epistemological scepticism. Here, I bring him in simply to add to the point that different sorts of conclusions about suffering can and have been be drawn by those equally as committed as Singer to a naturalistic and evolutionary perspective.

6.6 Morals evolving and morals evolved

In The Expanding Circle (1981) Peter Singer linked his thesis from Animal Liberation (it is wrong to restrict the principle of equal consideration of interests
to our own species) to a biological and psychological theory, on the back of developments in theories about the evolution of altruism.

The circle of altruism has broadened from the family and tribe to the nation and race, and we are beginning to recognize that our obligations extend to all human beings ... The only justifiable stopping place for the expansion of altruism is the point at which all whose welfare can be affected by our actions are included within the circle of altruism. This means that all beings with the capacity to feel pleasure or pain should be included; we can improve their welfare by increasing their pleasures and diminishing their pains (Singer 1981 [2011], 120).

He also frames his expanding circle argument as a rejection of anthropocentrism: “we are not the only species on this planet”, and “should not value everything by its usefulness to human beings” (121). How far should this circle of altruism extend? Singer is prepared to at least include “most” organisms. (Whether it ought to include oysters or other “rudimentary” organisms he doubts). Sentience is, he argues, a non-arbitrary boundary for ethical consideration. Species membership is not. The idea is that, when comparing similar interests (the interest any animal might have in avoiding pain), we should, following this line of reasoning, give equal weight to, for example, to sentient human and sentient mouse.

I have commented—following Kahane—that this kind of argument rests on the claim that a naturalistic account of human evolution “debunks” the historical arguments that have been used to justify the practice of valuing usefulness according to human needs and interests. However, Singer has more recently (Singer 2005 and 2011) embarked on a much more ambitious project: using arguments that appeal to the evolutionary origins of our evaluative beliefs to undermine or “debunk” the practice of using our moral intuitions to justify normative ethical claims. The form of the argument is that if our moral intuitions are the biological residue of our adaptive history, it is not obvious why we should consider these intuitions as having normative force. Singer wants to find out,
however, if there is the possibility of reliably distinguishing between our “immediate emotionally based responses” and our more reasoned conclusions” (2005, 350) or “judgments that have a rational basis” (2011, 196). If we can do so, he hopes we may arrive at ethical statements of principle that we can rely on because they are rational, rather than being an evolutionary adaptation.

The problem with using our intuitions as the basis for normative ethics, Singer worries, is that they have emerged from contingent biological and historical circumstances. Since “the direction of evolution neither follows nor has any necessary connection with the path of moral progress” our moral intuitions cannot be used as an ultimate justification of our moral positions (2005, 343). Our ethical intuitions derive from our evolution as complex social animals, which is no rational process, so this renders them opaque to us, and useless as formal evaluative principles. But Singer does still want to retain the possibility that good or bad with respect to at least some kinds of judgments can in principle be assessed rationally, without the potentially distorting influence of either our biological inheritance (or the kinds of historical metaphysical views that evolution has exposed as untenable—things like special creation).

In an updated afterword for The Expanding Circle (2011) Singer uses recent psychological research into peoples’ responses to theoretical ethical dilemmas to suggest there is at least some hope of distinguishing between “immediate emotionally based responses” and “other judgments that have a rational basis” (2011, 196). In pressing this distinction, Singer hopes to show that there is

... an alternative to reliance on everyday moral intuitions that, according to the best current scientific understanding, are emotionally based responses that proved adaptive at some time in our evolutionary history.

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32 The assumptions and methods behind some of these kinds of investigations, e.g. the trolley dilemmas made famous by Joshua Greene and colleagues, have been criticised by Kahane, among others. See e.g. Kahane 2015.
He wants, in other words, to preserve the possibility that there are moral positions that could in principle be arrived at by “all rational sentient beings”—“even rational sentient beings who had evolved in circumstances very different to our own” (204).

In the 1981 edition of *The Expanding Circle* Singer had originally argued that if we stripped away distorting influences on our moral beliefs, we could arrive at this rational principle: “one’s own interests are among many sets of interests, no more important than the similar interests of others” (2011, 106). But in his 2011 afterword, he writes that he has since come to worry that the claim that one’s own interests are “no more important than the similar interest of others” is still a ‘normative claim’, and “if I deny that normative claims can be true or false, then I cannot assert that this claim is true” (199).

The denial of the possibility of objectively validating normative claims leads “not to preference utilitarianism … but to scepticism about the possibility of reaching any meaningful conclusion at all about what we ought to do” (200). Yet Singer still wants to resist exactly this sceptical conclusion. He has argued, for example (Singer, 2005) that there are some kinds of ethical statements that can be accepted as reasoned or rational axioms, rather than intuitive responses susceptible to evolutionary explanations. One such “rational intuition”, he thinks, is “the intuition that five deaths are worse than one, or more fundamentally, the intuition that it is a bad thing if a person is killed.” The intuition that tells us “the death of one person is a lesser tragedy than the death of five” is, he asserts (rather curiously, to say the very least) of a different kind to other sorts of intuitive responses, and it “does not seem to be one that is the outcome of our evolutionary past” (350).

The avoidance of moral scepticism is what—by Singer’s own admission—motivates his commitment to “the ambitious task” of trying to separate those moral intuitions that are an outcome of our evolutionary past from ethical
axioms with “a rational basis” (351). Guy Kahane, however, points to the broader difficulty with this project: that the practice of appealing to evolution to selectively debunk our moral beliefs in a “piecemeal” fashion—presumably hoping that the ones you are attached to can actually survive the cut as “more reasoned conclusions”—poses a considerable risk. This is because once we set out to purge our evaluative beliefs of the distortions of their evolutionary history to see what remains, it may turn out that not just some, but most or even all, of our evaluative beliefs—even the ones the we most cherish—turn out to be “vulnerable to evolutionary debunking” (Kahane 2011, 119). This may, indeed leave us with a position “more Nietzsche than Singer” (119). Kahane includes in this list of evaluative beliefs that might well need to go the central and cherished tenet of utilitarianism: the idea that “pleasure is good” and “pain is bad” (2011, 120). He adds as an aside—and I agree—a footnote that suggests that the solution to this concern might be simple. There are obvious evolutionary explanations for our aversion to pain. This is a practically reliable and sensible kind of intuition. We do not need ambitious claims about the justifiable truth of this conviction (56) to accept it as having a serious social claim on us.

In a similar vein, a sceptic might also doubt the practical value of seeking to ground as an objective truth the claim that all living things are entitled to prima facie equal consideration of their interests. Even if, for argument’s sake, we could justify this to be a rational axiom rather than a normative claim vulnerable to debunking, it would be impossible to cash this axiom out in any practically untroubling or meaningful way. We live an increasingly complex existence, heavily socially and economically stratified, mediated by elaborate technologies. The interests of both animals and humans coexist in highly complex and codependent relationships difficult if not impossible to assess rationally. Huxley was wary of Utopian social proposals and grand theoretical statements, and a keen enough observer of human psychology to see that many admirable propositions and high-minded social schemes that seemed to be based on entirely reasonable principles would surely meet formidable practical obstacles in
the event it was attempted to put the proposals into practice. This was the reason for his rejection of the idea that humans might be able to engineer what he had called the “pigeon-fancier’s polity” by the administration of marriage rules and other policies aimed at supposedly encouraging the best-adapted human “progeny” (Huxley 2009, 21). Simply put, Huxley thought that given humans, it could never work. More recently, John Gray (2014) has gloomily observed that human animals seem quite capable of increasing our knowledge without obviously learning from experience. A dogged sceptic might point, as evidence in support of this claim, to wars to keep natural resources concentrated in the hands of the few, religious terrorism via YouTube, or the struggle to reconcile the supposition of rational economy with the devastating trajectory of our present rates of overconsumption.

I have here insisted that the mere fact of common ancestry cannot lead with Newtonian certainty to particular claims about our responsibilities to nonhuman animals. It would be quite consistent to call oneself Darwinian and argue, for example, that if one accepts pain and suffering as an inevitable fact in the natural world, then the suffering of animals is no special case, given that humans suffer too (and as some like Huxley and Freud speculated, perhaps with an added psychological dimension). Pain might be subjectively undesirable and as such have a negative value, but as Kahane comments, it is also ubiquitous, and “we couldn’t possibly pay attention to, let alone care about, each and every instance of pain on the planet” (Kahane 2014, 750). Huxley had drawn enough from Hume and Kant to know that the project of being a coherent philosophical naturalist was demanding. His ethical position was founded on a premise that seems at complete odds with Singer’s: that “we should cast aside the notion that the escape from pain and sorrow is the proper object of life” (Huxley [1893] 2009a, 86).
6.7 “The truth as far as our reason permits us to discover it”

I want to conclude this chapter by looking a little more at the tradition of and possible implications of evolutionary sceptical arguments. Darwin and Huxley both rejected any metaphysical distinction between formal morality and material morality of the sort that would allow an action to be deemed moral only if performed “deliberately, after a victory over opposing desires, or when prompted by some exalted motive” (Darwin 2004, 134; Huxley 1871). It was not possible, according to Darwin, to draw clear distinctions about the motives for any particular act. For Huxley, “the logical consequence” of defining moral acts as only those consciously directed to the fulfillment of duty would be “the denial of all moral value” to sympathy and affection and to “the most beautiful character to which humanity can attain, that of the man who does good without thinking about it” (1871 [1890], 288).

Huxley was here responding to St. George Jackson Mivart, who, reviewing the *Origin* declared instinctual acts could hardly be an evolutionary basis for a moral code. Moral acts depended on free moral agents not well-acting dogs, and Darwin’s “radically false” metaphysics would have an “injurious” moral effect on “half-educated classes” (Mivart 1871, 90). And indeed ten years later, William Graham warned in *The Creed of Science* that a vogue for evolutionary explanations of morality threatened to drown faith, hope and especially, charity, under a wave of moral nihilism (he had in mind in particular, Spencer). The “sacredness surrounding the notion of duty” was being “dissolved by scientific analysis” leaving a picture of morality as “merely” a human invention (Graham 1881, 387). Society’s soul would be threatened with extinction if “the evolution teaching” were to prevail (386).

Darwin responded to Graham’s book in a remarkable letter, in which he employed the epistemic logic of his own theory to politely but deftly undermine the author’s criticisms of it. Darwin wrote:
there are some points in your book which I cannot digest. The chief one is that the existence of so-called natural laws implies purpose. I cannot see this ... look at the moon, where the law of gravitation—and no doubt of the conservation of energy—of the atomic theory, &c. &c. hold good, and I cannot see that there is then necessarily any purpose. Would there be purpose if the lowest organisms alone destitute of consciousness existed in the moon? But I have had no practice in abstract reasoning and I may be all astray. Nevertheless you have expressed my inward conviction, though far more vividly and clearly than I could have done, that the Universe is not the result of chance. But then with me the horrid doubt always arises whether the convictions of man's mind, which has been developed from the mind of the lower animals, are of any value or at all trustworthy. Would any one trust in the convictions of a monkey's mind if there are any convictions in such a mind?

(DCP, Letter no. 13230)

A number of contemporary philosophers, sharing Darwin's doubts about the essential trustworthiness of the mind as a natural product, have advanced metaethical arguments that an evolutionary perspective threatens the epistemic justification of our moral views (e.g. Street 2006). These arguments have some important differences between them but they hinge on the common suggestion that while evolution might be able to explain with plausibility why we have certain moral beliefs, the nature of the evolutionary process gives us no reason to suppose that the function of these beliefs is to track moral truths.

Paul Griffiths and John S. Wilkins (2015) agree that the idea that an evolutionary perspective "debunks" ethical beliefs has force against strongly realist ethical theories that depend on some version of the idea that there are objective moral facts that are tracked by the believer. If we deny, however, that evaluative beliefs denote moral realities, then non-cognitive evolutionary theories about morality—which assume that ethical beliefs might have other functions like expressing allegiance to social norms—are not perturbed by this perspective. Benjamin Fraser (2014) has gone further, suggesting that there are empirical reasons to
conclude our moral faculty is actually unreliable, and that our moral beliefs “are unjustified” (2014, 472). Among the reasons he gives for thinking so are that expedient, imperfect and sometimes error-prone cognitive mechanisms can be adequate candidates for natural selection, and that our evolved faculties for moral cognition are presently operating in historically novel environmental circumstances.

Such debates are far from settled, and won’t be settled here. The importance of these ideas is that they remind us of the considerable difficulties entailed in trying to argue to moral certainties from evolutionary premises. This represents a challenge, for example, to viability of the theory of moral individualism laid out by James Rachels (1990) in Created from Animals: The Moral Implications of Darwinism. Like Singer, Rachels starts with our evolutionary common ancestry to argue for a new ethic in our treatment of nonhuman animals. He begins with three assumptions. The first is that common ancestry undermines “traditional morality”. The second—and Rachels constructs the theory of “moral individualism” around this—is that humans are autonomous, rational agents, but not uniquely so. And the third is that the principle of equality “mediates the fit” between the theory of moral individualism and “an evolutionary outlook” (197). “Traditional” morality is supposed by Rachel to rest on two key claims that are demolished by evolutionary common ancestry: that man was fashioned after god, and that man is a uniquely rational animal. This seems problematic from the start, however, in that it appears to imply that prior to Darwin, there was an essentially monolithic tradition of thought in which nonhuman life was ascribed “relatively little value” (4) and humans were assumed to have no moral duties to other species. This is, as we have seen, highly contestable. In the first half of the nineteenth century, just for example, many opponents of animal cruelty drew on quite “traditional” tenets of Christian belief (ideas like charity and compassion), the Benthamite conviction that we had a moral duty to minimise suffering, or even just a repugnance to the violence of activities from butchery to blood sports, to argue for our moral duties towards other animals (Gregory 2007).
Rachels also claims that “pre-Darwinian thinkers” found it “convenient to deny that animals have any significant psychological capacities” (130). Again, this kind of sweeping historical claim is dubious, but we may set that aside here to investigate Rachels’s ethical theory.

A crucial implication of common ancestry for Rachels is that it removes the basis for arguing that only humans are rational agents. We must allow that many nonhuman animals can behave rationally, following Darwin’s lead in the *Descent* and the *Expression*.33 Rachels also places a strong emphasis on social and altruistic behaviours—which in fact points us directly to Rachels’s real target in this book: philosophers who have argued that Darwin leads us to a corrupting moral scepticism or devalues human life. Rachels wants to deny that these views follow as a consequence of evolution. Rachels, like Singer, is therefore selective about the targets of his own evolutionary scepticism. “Traditional supports” for the idea of human dignity are declared to have “not survived the colossal shift of perspective brought about by Darwin’s theory” (171). Yet Rachels says little of the significance or implications, of, for example, Darwin’s views about what is often referred to as our “epistemic boundedness” (Griffiths and Wilkins 2015). Darwin’s own thoughts about the evolutionary process had led him to the agnostic conclusion that there may be certain limits to the human mind’s ability to comprehend the fundamental nature of the world. Perhaps we would always exist

33 Let us here just note that there is a more epistemically sceptical way we could treat this point. It may be that—rather than emphasising that animals behave rationally and autonomously—evolutionary theory suggests there are good reasons to question whether *humans* have the degree of rationality and autonomous agency we are often supposed to have. This needn’t entail the strong position of denying that our beliefs are false or unreliable, but the evolutionary process no doubt throws some constraints around the reliability of our capacities and epistemic judgements, and the extent to which we can “bootstrap” (Griffiths and Wilkins, 2015) ourselves beyond them. Stephen M. Downes, for example, has cautioned that philosophers frequently seem to assume that our cognitive mechanisms are adaptations for discovering truths about the environment in which they evolved. Philosophers often tacitly conceive of humans in a particular way: as “epistemologists with well working visual systems acting in a well-marked inanimate environment” (Downes 2000, 432).
in a kind of psychological tension with the world. The empirical evidence of pointless pain and suffering seemed to deny the plausibility of the argument that nature was designed, purposeful or beneficent, yet the human mind appeared to resist this conclusion. Darwin might have had some confidence in our ability to apprehend nature’s laws, but he strongly doubted such a study could ever answer to our engrained psychological yearning for truth, purpose or moral certainty. Perhaps the answer, as he wrote to Asa Gray in 1860, was to set aside such questions as unanswerable, and merely “hope & believe” what one could (DCP, Letter no. 2814).

One of the things that Rachels takes to be untouched by the “colossal” shift in perspective afforded by Darwin is the principle of equality. In his theory of moral individualism, Rachels links this to his point about rationality. Since rationality is not exclusively human, it is not a sufficient basis for drawing moral distinctions between humans and nonhuman animals. Other criteria are required. The assumption behind moral individualism is that making an objective assessment of the morally relevant differences in any given deliberation or situation where the interests of two agents (such as a person Y and animal C) might conflict or compete is in theory possible. Species membership cannot in and of itself be a sufficient consideration—the point of moral individualism is that being human does not necessarily entitle one to greater consideration. Because evolution implies that humans are not different in kind to nonhuman animals, we are compelled to reason differently in order to apply the principle of equality consistently. However, Rachels never clearly explains why the principle of equality itself survives the Darwinian perspective challenge unscathed. But surely, as Michael Bradie notes (1997, 86), it is just as plausible to construe from the evolutionary process that “it is no respecter of individuals as individuals”.

Another of Rachels’s claims is that evolutionary common ancestry undermines “traditional” notions of human dignity and value, but he goes on to argue that there is, in fact, some intrinsic value in human life—and certain kinds of animals’
lives. The basis for this value is that *those lives are valuable for the subject of that life* and that the subjects have rich biographies. Indiscriminately killing animals is therefore taken to be morally wrong, since some, like humans, have rich lives, and we don't indiscriminately kill humans. But again, there is a plausible counter-thought (Bradie 1987). Rachels himself argues that there's nothing in an evolutionary perspective to sanction a social behaviour like sexist discrimination—even if there were to be evidence of its adaptive value. Surely if we follow this logic it is similarly plausible to argue that the evolutionary process furnishes no basis for speculating on the value of any particular life, our individual attachments to our biographies notwithstanding. Indeed evolution might equally well be held to suggest that individuals count for nothing, being only “temporary repositories of genetic potential” (Bradie 1997, 86). So it is hard to see that the position of moral individualism, with its emphasis on individual equality, flows as clearly from an evolutionary perspective as Rachels hopes.

My point in this chapter has been to show how difficult it is to establish that the fact of evolutionary common ancestry leads logically to particular claims about how we should treat animals. One obvious challenge is that such arguments are entirely dependent on a certain construal of Darwin’s views. Some other assumptions are always required. On another construal of evolutionary logic, the morally sceptical conclusion that Singer and Rachels are determined to avoid seems to be precisely where Darwin leaves us.

This should not preclude us from deliberating about our acts and their consequences. For example, one might identify salient arguments to reject a practice like factory farming, which comes among other things, at a massive environmental cost and the cost of the measurable pain and suffering of animals—which for many human beings elicits a natural and powerful revulsion that may itself suffice as a good enough reason for acting to prevent it, rather than treat it as we do now as a necessary consequence of our mode of production. It seems unlikely, however, that the appeal to evolutionary common ancestry gets
us very far in this regard. So it must then become a matter of the messy human art of political and social persuasion—which may start from other premises: we might appeal to human psychology, animal physiology, or the observation that intensive farming is first and foremost a practice that emerges from economic assumptions which can be examined according to the claims on which they rest. Relevant data might, for example, include evidence of the costs of environmental or psychological damage, the assumptions about use and value of resources built into an intensive farming model, species welfare, or effects on human health.

Moreover, appealing to Darwinian continuity combined with utilitarianism as a basis for drawing ethical conclusions does not seem to get us closer to moral clarity or certainty. Consider the notorious problems of trying to apply interest-based or value-based arguments in the context of something like the preservation of species diversity. How do we value complex ecosystems? Is this value abstract, aesthetic, or is it practical and quantifiable? Do invasive species have rights? And in an age that has been rightly called the Anthropocene, is it possible to deliberate in a way that is not “anthropocentric”—given that there is no ecosystem on earth that exists entirely untouched by human activity, and some complex ecosystems that are its direct product and now fully depend on that activity?

Rather than concern ourselves with avoiding moral scepticism, we might perhaps take a different view altogether. I don’t see much use in pursuing whether any given moral intuition is or is not an outcome of our evolutionary past. I think it turns out to be a redundant exercise. And as Darwin himself suggested in the Descent, the present content of any of our beliefs, just like the present form of expression of our emotions, is not readily disentangled from the contingent origins of its evolution. Applying evolutionary scepticism to the basis for our evaluative beliefs undoubtedly, I think, brings us closer to Nietzsche than to Singer. But is this really the problem we might imagine it to be? Kim Sterelny, following a line of thought opened by Hume, and in agreement with the line that
Darwin follows in the *Descent*, has recently emphasised our moral capacity as arising out of our perceptual openness to the emotions, with the emotional responses of others as the most salient feature from which our moral norms emerge. Morality is the highly articulated product of our sociality. As such, our moral codes are indeed, artificial. They’re also imperfect, pluralistic and (I would suggest) in a non-trivial and philosophically rich way *aesthetic*. Our moral systems are a sometimes-messy amalgam of “explicit principles, rules of thumb, know-how and prototypical representation” (2012, 169). Our minds are adapted for moral learning, Sterelny thinks, but that’s an inherently practical activity, eluding scientific or historical reduction, and always in a feedback loop with our changing social structures and material technologies. Importantly, our moral faculty is now required to operate in a novel environment of unprecedented social and technological complexity.

Recognising the limits of our capacities does not alter the fact that humans are persistent moralisers. Neither Darwin nor Huxley ever suggested that the message to take from the evolutionary process is that humans were amoral. Moral content might be variable—but moralising is authentically human, and evolutionary science throughout the twentieth century has increasingly yielded insights into how human ethics have emerged as a product of common ancestry. An important recent contribution to this is Sterelny 2012, while Lewens 2007 provides a useful synopsis of the current state of these debates. One theme that emerges from all this, in a manner that may well have surprised the agnostic Huxley, is that it is at least possible to discern from a study of our ancestry some broad patterns which provide insight into why we are the sort of moraliser we are, and in what way that differs from other species. E.O. Wilson might have been quite right, on one level, to be grateful that hamadryas baboons have not so far got around to making nuclear weapons (E.O. Wilson 1978). A truly radical sceptic might shrug at even that, on the basis that none of it “matters” in the great scheme of the cosmos. But the human animal does have nuclear weapons, and we are a social and moral species, and we are also presently the only kind of
animal that makes quite such a thing as a factory farm. In these facts, as in so many other things, our difference from nonhuman animals is what seems morally germane—if by morality, we take Darwin’s idea that to be a moral being is no more or less than to be one capable of comparing past and future actions or motives, and of approving or disapproving of them. But Darwin’s definition is a point about moral capacity, not the content of moral belief. Evolutionary theory is itself frustratingly but necessarily impervious to attempts to divine from it any instruction about how we should act—it suggests only why we might be the sort of moral agent we are. We are neither condemned nor made sacred by this inheritance. We must make of this what we can. This was, after all, surely the spirit in which Darwin concluded the Descent.
CHAPTER 7. ENLIGHTENMENT ON A PLANETARY SCALE?

Light will be thrown on the origin of man ...

DARWIN
On the Origin of Species

There is greatness in understanding the basic elements of human evolution and wisely acting upon the way they are linked. The form it is taking can be expressed succinctly as follows: the biosphere gave rise to the human mind, the evolved mind gave rise to culture, and culture will find the way to save the biosphere

EDWARD O. WILSON
Half-Earth

Removing the masks from our animal faces is a task that has hardly begun.

JOHN GRAY
Straw Dogs

7.1 Darwin’s ambivalence: “hope & believe what one can”

The starting point for these final two chapters is what I will characterise as Darwin’s ambivalence. I focus on two contemporary writers who have considered, but drawn very different conclusions about, the ethical, epistemological and ontological implications of descent with modification. These writers are the evolutionary biologist Edward O. Wilson (chapter 7) and the philosopher John Gray (chapter 8). I consider their conclusions as readings that diverged from Darwin’s ultimately open-ended and ambiguous message about the future possibilities for the human species. The links are made discursively and thematically, and with reference to other relevant authors. In this discussion, I will draw, in particular, on two of the paired themes outlined in my introduction: moral agency—determinism, and cosmic significance—evolutionary (in)significance. I do not attempt or offer an exhaustive chronology or genealogy of the scientific works of Wilson or the philosophy of Gray. I will discuss aspects of the history of Wilson’s scientific ideas, but only insofar as they shed light on my main interest, which is to examine his broader epistemological and ontological commitments in the light of common ancestry.
Darwin’s concluding message in the *Descent* was one that he had expressed in 1860 in a letter to Asa Gray: let each man “hope & believe what he can” (*DCP*, Letter no. 2814). He could still talk of man at the “summit of the organic scale”, and of “hope of a still higher destiny” (2004, 689)—terms familiar and soothing to nineteenth-century readers. Yet he checked their power with a note of ambivalence that strikingly presaged a more modernist turn of thought, delivering a sober message about human ancestry that severely limited the scope of those “hopes”, countering them with the suggestion of other, less desirable, “destinies”. Darwin wrote ominously that if “man” was to “advance still higher”, he must remain “subject to a severe struggle” (688). To be human at all was to be a provisional entity, subject to, and regulated by, powers and laws at best dimly perceived by science, and perhaps even ultimately undiscoverable. It was also to be perennially at risk of sliding into physical, psychological or moral “indolence” (688).

In his conclusion to the *Origin*, Darwin had cloaked his evolutionary message in an appeal to the Romantic imagination with an image of natural selection working for “the good of each being” and of “exalted” higher animals *emerging* from the battlefield of “famine and death”, as though suggesting that nature’s fundamental goal was to be appreciable as art. In the *Descent*, Darwin’s nature had been stripped of all vestiges of purpose, and art was merely another “product” of a more fundamentally alien, and far less elevated, process. The ornamental beauty of male beetles emerged from their jealous possession of females who laid eggs in fresh dung. The origins of human art did not emerge from “exalted” nature or spirit, but from courtly birds, via naked “Barbarians” “bedaubed with paint” on a “wild and broken shore” (689). What is striking about the conclusion of *Descent* is that Darwin wears his ambivalence openly, unburdened by the need either to foster the hopes, or dispel the fears, of his readers.
Two distinct conceptions of the implications of the Darwinian theory of human descent branched off from this ambivalence. One was fundamentally confident and hopeful, emphasising empirical knowledge about the evolved human species as the way to a higher destiny—even if the outcome of that knowledge might be to reveal us as in certain ways constrained by our evolutionary inheritance. The other path emerged from Darwin’s darker hints about the obscure problem of making evolutionary progress, and pressed towards the limits of epistemic and moral scepticism. These two paths necessarily tracked twentieth-century developments in the biological sciences and in evolutionary theory, which continued to delineate new boundaries for human psychology and our epistemological access to the world. Darwin had gestured to a disjunction between the way science might describe the human species, and the prevailing language and conceptual apparatus of philosophy, psychology and theology. By the twenty-first century, this epistemic gap had been widened by the modern synthesis and developments in genetics and molecular biology, developmental biology, evolutionary psychology and cognitive neuroscience. These disciplines threw up radical and heterodox new terms for describing human nature and human agency, a number of which would certainly have been strange to Darwin. He, after all, still believed securing human progress and furthering moral development were legitimate goals of his new psychology, albeit that he admitted that effecting progressive change was “a most intricate problem” (2004, 688).

For E.O. Wilson, evolution’s message was that we are a “brilliant, emergent” animal, possessed to a unique degree with a desire and an ability to know (E.O. Wilson, ([1998] 2006, 333). He hoped this urge to know would lead the species to recognise and curb the instincts of the “Catarrhine primate” within, as well as the fallacy of our metaphysical attachment to the idea we are exempt from nature’s laws, and so avoid hurtling off on an unplanned but ecologically disastrous evolutionary trajectory amplified by “machine-aided ratiocination”. John Gray, concluding that humans are “far more like machines and wild animals than we
imagine” (Gray 2003, 115), has declared the human animal to be powerless to control its fate.

E.O. Wilson is a Darwinian and naturalist who has dedicated his literary life to pursuing a twenty-first century Enlightenment, in which the human species finally makes peace with its divided self as molecular biology, genetics, neuroscience and sociobiology close one of the last “major gaps” in scientific knowledge—that between human mind and human body (Wilson 2000a, vii). Gray has used the fact of our evolutionary common ancestry as an incendiary weapon against enlightenment and “evangelical” Darwinist “orthodoxy” alike, in a bid to blow apart the last foundations of the “humanist belief in progress” (2003, 4). There is a deeply ironic contrast between where the accounts of Gray and Wilson end up. Gray—the humanities scholar, a retired professor of European thought and an analytic philosopher—has yoked images of a brute struggle for existence in the twentieth and twenty-first centuries to developments in the biological sciences, to draw an unflinching conclusion about human moral agency in the world “shown to us by Darwin” (4). His conclusion is that our moral philosophies—even those purported to be naturalistic, scientific and secular—are just the inventions of a species that has deluded itself about the nature of its freedom. Most scientists, he argues, have failed to face in full what it really means to track Darwinian naturalism to its conclusion. On the other hand, Wilson, who in 1975 created a scandal that had the whiff of moral panic about it with his call to turn the study of ethics over to biologists, has become evolutionary biology’s great moral novelist. Wilson evokes a vast and panoramic vision of evolution to carry his existential search for the Darwinised frontiers of human freedom. It is a little-noticed clue to this reading that the opening and final sentences of his most famous work, Sociobiology, are given over not to a quote from Darwin or from a giant of the modern evolutionary synthesis, but from the philosophical novelist Albert Camus (Wilson [1975] 2000b; p. 3 and p. 575).
Inevitably, both Gray’s and Wilson’s speculations about common ancestry have been tangled with the historical events of a turbulent and ethically troubling epoch in which the human species has had a shattering impact on both the natural world and its own kind. The twentieth century was, after all, that of both the tribal-industrial “corpus mysticum of Nazism and the class warfare doctrine of Marxism-Leninism” (E.O. Wilson 2006, 272–3), and the unprecedented global expansion of a relentless species augmenting its capacities with technologies with far-reaching effects still yet to fully play out. In the twenty-first century, whole states can be characterised by the beastly appellation “predatory” and “any country that renounces technology makes itself the prey of those who do not” (Gray 2003, 178). A preoccupation with good and evil, with transgression and redemption, is as ancient as human culture itself. But the human animal faces ethical dilemmas of a species never imagined by the principal architects of its major moral philosophies, and of an immediate practical complexity far beyond anything faced in the social and environmental niches, or the more complex and articulated societies, of our past. How might we respond to this? My exploration of Wilson and Gray will focus on two particular routes that have been taken, tracking out from Darwin. Wilson has set out along the optimist’s path lit by an undimmed faith in the power of evolutionary investigations to propel the species to better destinies. For Gray, Darwin opens up the doubter’s way, suggesting we must shed our habit of epistemic over-reach and confidence in progress as the last legacies of a pre-Darwinian Enlightenment dream.

7.2 The death of the world and the death of H.G. Wells

A paradoxical and interesting historical figure may shed some light on the history of both divergent paths. The Darwinian biologist E. Ray Lankester was a protégé of Huxley and an acquaintance of Marx. Through Marx, he had met Engels (Paul 1983), and Engels and Lankester were two of just a handful of mourners at Marx’s funeral (Gould 1999). Lankester was also a friend of the novelist and intellectual figure H.G. Wells (Barnett 2006). Lankester denied that the evolutionary process...
implied any definite tendency to progress or improvement, but he was sanguine about the power of science to form a stout bulwark against any moral or physical slide to degeneration in the human species. Indeed, science was the only possible route to emancipating humankind from the ruthless judgement of nature. In construing science as a fundamentally morally directed activity, he was in agreement with Huxley, and in 1905, he followed in Huxley’s footsteps to deliver the Romanes Lecture. The argument of *Nature and Man* (Lankester 1905) was that the future survival of the human species would depend on driving an ever-greater wedge between “man” and the natural world. The reason for this was that the human species had already headed down the path of rebellion against nature—but nature lurked ready to take revenge. It was therefore necessary for man to consciously and deliberately assume a “kingdom” (Lankester 1905, 6) founded on scientific knowledge and a naturalistic understanding of the mind, in order to protect the rebellious human meddlers from nature’s vengeance. Lankester feared, among other things, pressure on the capacity of agriculture to sustain a growing human population in a world where humans were staving off nature’s Malthusian corrective of contagious disease. Humans, he argued, had also defied the evolutionary process in another way, because in nature, “the congenitally diseased are destroyed before they can reproduce” (29). The essay therefore was suffused with eugenic themes that would also be expressed that year by H.G. Wells (Wells 1905).34 In the “extra-human” system of nature (29), where man alone “increased in numbers”, Lankester thought that it was “probable” that humanity would recognise the rational necessity of submitting to “restriction by the community in respect of the right to multiply” with grace (34). He thought that man, by virtue of his knowledge of the natural world, had achieved “spiritual emancipation and freedom of thought” (24), though man was a product of nature through and through. Now that task was to use this freedom in frank defiance of nature, to prevent the ruin of the species.

34 The essay also touched on another Wellsian theme: speculation about intelligent life on Mars (although Lankester insisted he was sceptical about this possibility).
Richard Barnett (2006) and Ian Hesketh (2015) have outlined how Lankester’s attitudes to the role of science were connected back to his nineteenth-century biological theories. Hesketh describes how, in *Degeneration: A Chapter in Darwinism* (1880), Lankester had argued that evolutionary change by no means moves inevitably towards either equilibrium or the elaboration or improvement of existing forms. Following Anton Dohrn, Lankester argued that a process of “Degeneration” could also have explanatory force—the “loss of organisation making the descendent far *simpler* or *lower* in structure than its ancestor” (Lankester 1880, 30, author’s italics). Lankester described some species as being characterised by a loss of complexity as they reached their adult structure. From this biological theory of degenerative evolution, Lankester extrapolated outwards to explore and explain patterns in human history. While Lankester did not support a generalised application of the view that “the savage races of mankind were degenerate descendants of the higher and civilised races” (57), he certainly made the more restricted claim that “the most barbarous races … the Fuegians, the Bushmen, and even the Australians … exhibit evidence of being descended from ancestors more cultivated than themselves”. This was interpreted as a caution and a warning: the possibility that white Europeans could also degenerate to a lower form was “worth some consideration” (59). There was only one hope for the “protection of the race” against this degenerative possibility: “the full and earnest cultivation of Science” (62). Darwin had referred to Lankester’s ideas about the destructive effects of intemperance as having a bearing on his own ambivalent discussion of the “problem” of human progress, with its implication that the effects of “civilising” social policies might curb the more arid adjudication of natural selection (Darwin 2004, 163).

Hesketh also draws attention to the important and more general role played by the emerging nineteenth-century science of thermodynamics and the theory of entropy in curbing optimism about the future perfectibility of the species and the inevitability of evolutionary progress during the second half of that century. The “biological analogy to the law of entropy” was Lankester’s conception of
evolutionary degeneration (Hesketh 2015, 209). Barri J. Gold (2010) has also revealed how thermodynamic concepts and ideas about energy were deeply embedded in the poetics of Victorian literature and science—from Spencer’s vision of a unifying, persistent and transformable “force” that fired his evolutionary imaginings, to the themes of enervation and decay—of decadence—in texts as varied as Wells’s *Time Machine*, Stoker's *Dracula* and Wilde’s *Portrait of Dorian Gray*. The physicist John Tyndall even argued that in an age of “grand generalizations”, the “doctrine of the Conservation of Energy” was of “still wider grasp and more radical significance” than Darwin’s theory of the origin of species, and that its “ultimate philosophical issues ... are as yet but dimly seen” (Tyndall, 1874).

Huxley was another who had warned that the theory of evolution “encourages no millennial anticipations” (Huxley 2009a, 85). The time might come when it was lichens—not complex mammals—that were fittest for prevailing conditions. The future end of things had also been on Darwin’s mind as he drew towards his own death. He mused in his *Recollections* that the “mystery of the beginning of all things is insoluble by us” (Darwin [1887] 2002, 54], but the ultimate end could be foretold in “the view now held by most physicists, namely that the sun with all the planets will in time grow too cold for life, unless indeed some great body dashes into the sun and thus gives it fresh life” (53). And if Darwin could still here write that “man in the distant future will be a far more perfect creature than he now is”, it then seemed to him an “intolerable thought” that he should, like all other sentient beings, be “doomed to annihilation after such long-continued slow progress” (53).

This same “intolerable thought” figured strongly in the last work of that great chronicler of the tribulations of natural man, H.G. Wells. Wells famously advocated a distinctive Darwinised socialism that was at times associated with eugenic ideas. Wells was no racial supremacist (Wells 1905, Partington 2002). He also rejected the idea of humans self-selecting to create ideal types (so-called
positive eugenics). He thought this ran counter to the principles of natural selection and would be antithetical to the progress of the species. However, Wells had seriously entertained the idea that preventing the ill, criminals, and individuals severely affected by birth abnormalities from breeding did have scientific sanction. In 1905, he speculated that any “modern Utopia” would have to reckon with its “congenital idiots, and madmen ... drunkards and men of vicious mind ... cruel and furtive souls.” The “breed of failure” must not increase lest they “take the race with them”. The disturbing Utopian solution lay in the hands of a government prepared to be “as merciful and deliberate” as it was powerful (Wells 1905, chapter 5).

By the later years of his life, however, Wells had concluded that the science was not even certain enough to support negative eugenic practices (Partington 2003). In 1945, then 78 years old, Wells returned to the message that the haunted traveller of the *Time Machine* (1895) had delivered from the edge of a far future shore under the light of a dying sun. *Mind at the End of Its Tether* was a book only 34 pages in length. It was a “little book”, and Wells’s last. Wells had “nothing more, and never will have anything more to say” (Wells 1945, v). This was also the last gasp of a nineteenth-century drama of man in heroic existential conflict with the laws of the natural world. For Wells, writing fifty years after the death of his one-time teacher Huxley, resigned himself to the view the natural laws that direct human life must ultimately obliterate all possibility in human endeavor.

The [human] secular process ... is entirely at one with such non-mental rhythms as the accumulation of crystalline matter in a mineral vein or with the flight of a shower of meteors. (3)

The moral to this was that “the human story” had already “come to an end”. There was no “pattern of things to come” (17). Nor was there the possibility of any compelling moral or scientific argument to “convince the reader” that he should in this world be kind, generous or dignified rather than “cruel, mean or cowardly” (18). For Wells, that was now merely an aesthetic choice—and if Wells himself
should prefer the former to the latter, this preference had no moral salience. *Homo sapiens*—“as [man] has been pleased to call himself”—was “played out” at last and “has to give place to some other animal better adapted to face the fate that closes in more and more swiftly upon mankind” (Wells 1945, 18). Even so, Wells recognised that it would also be human nature to find this conclusion about the rise and fall of mankind difficult to swallow:

> We want to be in at the death of Man and to have a voice in his final replacement by the next Lord of Creation, even if, Oedipus-like, that successor’s first act be parricide. All over this planet are scattered the traces and achievements of Man, and it demands an intense intellectual effort from most of us to realise that this wide distribution of human products, is a matter of the past hundred thousand years. (Wells 1945, 19)

Wells depicted the ancestors of *Homo sapiens* as “quasi-human lout-beasts” (32), uncouth in gesture and communication, hunting, bludgeoning, and taming fire against long, glacial winters. Modern *sapiens* had emerged from this past not as “the clumsy adult Heidelberg or Neanderthal man”, but as “another one of those relapses of the life-cycle towards an infantile and biologically more flexible form”—an “experimental, playful, teachable precocious child, still amenable to social subordination when already sexually adult”. The “primordial gross adult *Homo*” had finally ceded its place to “a more juvenile type” (33). Wells’s description of this species here eerily evokes the Eloi—those simpering remnants of the high age of capital whose childish egotism and psychological infirmity had become a deeply corrosive force. Even the certainty of sexual dimorphism was diminishing, according to Wells, and told of the dwindling of the modern human species into a genderless pusillanimity—“now men faint more frequently than women” (23).

It is possible that there are wide variations in the mental adaptability of contemporary mankind … [but they] may not be as readily accessible to fresh ideas as the younger, more childish minds of earlier generations, and it is also possible that hard, imaginative thinking has not increased so as to keep pace
In Wells’s final literary vision, humans cannot escape their cosmic insignificance. The very best that might be said of the “done for” (34) species is that some few might straggle through the wilderness of the ages to at least bear witness, when the moment came, to the inevitable extinction of all life. There is a perverse literary gusto to the way in which Wells luxuriates in his short tale of dissolution and submission to the cosmos. Facing the lonely fact of his own individual death, Wells—in a grand, literary-cum-theatrical gesture worthy of Freud—conjures the future death of humanity itself.

7.3 In 1975, or, “the shape of things to come”

Wells’s submission to the cosmos was an admission of epistemic and psychological resignation. If social expansion and complication had got ahead of the humans species’ evolutionary capacity for “hard, imaginative thinking”, this would indeed, be a “dark shadow” over the hopes of mankind. It was also a confession—having come to doubt the moral power of science to overcome this, what was left to Wells was the melancholy ruin of myth.

I want now to turn to a twentieth-century myth-maker of a different sort—one who has never lost faith in the power of science, and has coupled it with an imperial universalising evolutionary metanarrative (Hesketh 2014) about the shape of “things to come”. For E.O. Wilson, whatever the future might hold in store for the human species, it is not to be the victim of Oedipal parricide at the hands of a successor species. Like Wells had, Wilson recognises the unprecedented expansion and complication of human societies is an urgent problem for a species whose evolutionary emergence was tied to the demands of a very different kind of life. For Wilson, however, this is a problem that can still

35 “The Shape of Things To Come” was of course the title of a futuristic Wells novella, speculating on a future society of human polymaths.
be rationally solved.

A myrmecologist from the American South, Wilson would become an influential figure in evolutionary biology in the last quarter of the twentieth century. The work for which he is most famous, *Sociobiology* (1975), was a heady and controversial brew, with its claims for the total explanatory power of science, and its imperial insistence that the traditional tools of humanistic inquiry were inadequate to deal with the full implications and demands of Darwin’s theory of evolutionary descent with modification. What was needed to ensure our future survival, Wilson argued, was a total scientific account of human nature as an evolutionary product—a “human biogram” (E.O. Wilson [1975] 2000a, 548). Wilson’s argument was that only by systematically studying the biological basis for human social behaviour using the conceptual tools of evolutionary biology might we truly resolve important theoretical and philosophical questions about the past, present and future human condition. More than 40 years later, this is still his claim.

My intention in discussing *Sociobiology* is rather different from that of previous studies and commentaries that have focused on the scientific controversy around its publication and theoretical claims. I discuss *Sociobiology* in the context of Wilson’s life-long and ambitious search for the limits of human freedom and possibility. This has culminated in three recent popular works that are described by Wilson using the very literary term “trilogy”: *The Social Conquest of Earth* (2012), *The Meaning of Human Existence* (2014), and *Half-Earth* (2016). These works are poetic, artistic and philosophical in scope and temperament, as much as they are works about natural science. Making this clear in *Half-Earth*, Wilson describes the double name used in Linnaean classification as revealing the natural world in the manner of “magic”, and calls it “the poetry of science” (E.O. Wilson 2016, 158).

36 For investigations and commentary from varying perspectives see Kaplan 1978, Ruse 1979, Kitcher 1985, Hull 1988 chapter 6 and Segerstrale 2000. See also several reviews and essays collected in Maynard Smith 1993. For a well known, if highly contested, political critique, see Lewontin, Rose and Kamin 1984.
In 1975, *Sociobiology* struck a tone far from the poetic of this recent trilogy. In his concluding chapter, Wilson wrote starkly:

> It seems that our autocatalytic social evolution has locked us onto a particular course which the early hominids still within us may not welcome. To maintain the species indefinitely we are compelled to drive toward total knowledge, right down to the level of the neuron and gene. When we have progressed enough to explain ourselves in these mechanistic terms, and the social sciences come to full flower, the result might be hard to accept. (575)

These were strong claims for the absolute power of science to not just explain the human condition, but also to be the rational guide to our species’ future actions. Furthermore, they opened up the startling possibility that, in accounting for ourselves as an evolutionary product, we might find out things we were ill equipped to face. In 1975, many scientists and philosophers questioned both the moral wisdom and scientific validity of this project (Segerstrale 2000).

There were some who read a profound ontological insult into this zoological perspective. Wilson urged—against strongly prevailing cultural currents—that a thoroughgoing understanding of ethics would entail going beyond the practice of “consulting the emotive centers” of one’s own “hypothalamic-limbic system” to derive ethical conclusions. What was needed to “[interpret] the activity of the emotive centers as a biological adaptation”, in order to decipher “the meaning of the [human ethical] canons”. This came with talk of “allelomorphs” favoured by “individual selection” (2000b, 563), and a “schedule” of age-and-sex dependent biological ethics that might impart a higher genetic fitness than universal moral codes (563). He also speculated—ominously for some—of a possible biological basis for aggression, sex roles, and homosexual expression. Such talk seemed, to many, to conjure the vision of an amoral future arbitrated by the pronouncements of a generation of technocrats, while simultaneously stripping...
humans bare by suggesting that the everyday terms of human ethical interaction did not have authentic existence. It also seemed to be ideologically saturated.

Wilson’s point was that it was time to look at ourselves from an outsider’s perspective, and as just another animal, insofar as this was possible. But he did not maintain control of his rhetoric, and the strength of early resistance to his work seems to have genuinely surprised him (Wilson 2000a). Perhaps, as Ullica Segerstrale (2000) suggests, 1975 was not yet the time, given the political and ethical sensitivities of the post-war years and Vietnam, to speculate about human nature in such terms. This was a problem of political, as much as literary, judgement.

Sociobiology appeared at a time of social exuberance and faith in human political autonomy. The radical aspirations of the feminist, black power, anti-colonialist and animal liberation movements were collectively assaulting the moral authority of arguments that had, for millennia, been used to justify maintaining women, many of the peoples of the world’s nations, and a great number of other species, in states of bondage and cultural servitude. The promise of these projects was existential freedom. In this context, the hint that biology—which was, after all, science embodied—might have an eye to quantifying the limits of human possibility was loaded. These iconoclastic new perspectives on the discourses of power were suggesting that whatever science was, it was not the politically neutral or value-free enterprise that many of its past practitioners had hitherto claimed it to be. Science could also be employed to maintain the interests of dominant political classes and interests, naturalising them through language, rhetoric and metaphor, as Richard Lewontin, Steven Rose and Leon Kamin (1984) never tired of stressing.

A collective of biologists and students under the umbrella of the Sociobiology Study Group of Science for the People (1976) invoked fascism to warn against the alleged mischief at the core of Wilson’s work. They were vehement in their
insistence that Wilson’s book barely masked his supposed commitment to a dangerously naive biological (if not ideologically-motivated) determinism. 37 But their own position was hardly modest in its claims for the power of culture to shape human expression. Culture was absolutely decisive: “We can dispense with the direct evidence for a genetic basis of various human social forms in a single word, ‘None’” (Sociobiology Study Group 1976, 185). They added:

… we know of no relevant constraints placed on social processes by human biology. There is no evidence from ethnography, archeology, or history that would enable us to circumscribe the limits of possible human social organization. (186)

For these critics there was no legitimate scientific path by which the social organisation of animal societies could be linked to human cultures, even via analogy. In fact Wilson went further, often arguing for a homology between social behaviours in animals and humans, placing much emphasis on concepts such as kinship. His critics took this to be prima facie pernicious. Human social behavior could not be understood by “imposing human institutions on animals by metaphor, and then rederiving the human institutions as special cases of the more general phenomenon ‘discovered’ in nature” (184). It required a political analysis of the instructing role of human social and cultural institutions.

We cannot understand what it is to be a slave or a slave owner without first understanding the institution of slavery, which defines and creates both slave and owner. (186)

Sociobiology stressed that insights from the systematic study of animal societies were likely to also have applicability in the study of human societies. But Wilson did not argue that human social and cultural expressions were the unalterable outcome of unobstructed lines of genetic instruction, even though some critics

37 It is fair to say that most fair-minded judges, even at the time, did not agree that Wilson was advocating a straightforward position of biological determinism, whatever they might have perceived the weaknesses or strengths of Wilson’s claims to be. See, e.g. the collection of articles in Caplan 1978.
continued to simplify him as a crude biological determinist (e.g. Gould 1976 and Lewontin, Rose and Kamin 1984). Wilson certainly did talk of “general traits of the [human] species” (548), and the “influence of genetic factors toward the assumption of certain broad roles” (555, author’s italics), including homosexuality. But in fact, part of what actually needed to be explained, according to Wilson, was the plasticity of human social organisation, compared to other primates (548). Socialisation could, after all, go to a different extreme, like that of the social insects, resulting in “an approach toward uniformity in the statistical distribution of the kinds of individuals when all individuals within a colony are taken together” (549). In the insect case, “deviation by the colony from the statistical norms, can be disastrous”. Human societies, though, Wilson noted—precisely unlike insect societies—could contain “obvious inefficiencies and even pathological flaws”, yet endure (549). The slave society of Jamaica had been unquestionably “pathological” by modern moral canons, yet it had lasted for nearly two hundred years (549).

Our civilizations were jerrybuilt around the biogram. How have they been influenced by it? Conversely, how much flexibility is there in the biogram, and in which parameters particularly? (548)

Against the heightened political rhetoric of the 1970s, Wilson failed to convince his critics that his motivation was not simply ensuring it would be white men of science who retained the power to define human nature. At the very least, wrote the members of the Sociobiology Study Group, he viewed human nature through a myopic Euro-American cultural lens (184).

It seems safe enough to conclude that Sociobiology was not motivated by a naked desire to entrench prevailing power relations. Perceiving the problem of humans trying to investigate the extent or limits of their own agency, Wilson’s point was that we must start not from pure speculation but by treating the human animal as tractable to investigation “in the free spirit of natural history” (547). Like Huxley, Wilson was urging an orientation towards inquiry. The much-
misunderstood call in *Sociobiology* to (in Wilson’s own unfortunate term) to temporarily “biologicize” (562) ethics was in fact a point aimed at the methodological assumptions of ethical intuitionism and behaviourism. Wilson’s assumption was that getting meaningful answers about human nature would require an empirical, and explicitly evolutionary, approach to ethical inquiry.

7.4 Faust bargains for the biosphere

Wilson’s critics argued that this project was ethically suspect, and biologically determinist. But if Wilson can be called a biological determinist, it is surely not of the kind that his more conspiratorial 1975 critics imagined when they publicly accused him of racism (Hull 1988, Segerstrale 2000). And his ethical project, I will argue, has little to do with the canard of Lewontin et al. Nonetheless, Wilson—despite his own insistence on the importance of an empirical approach to inquiry—has proven himself to be a great speculator.

Wilson has recently been emphasised by historians as developing an “evolutionary epic” (Hesketh 2015 and 2014, Megill 2016). Hesketh has pointed out that the aim of this project far transcends the disciplinary bounds of evolutionary biology: Wilson wants to “take advantage of [the] mythopoeic drive in human nature in order to establish a new relationship between humanity and nature” (Hesketh 2014, 183). The “evolutionary epic” is Wilson’s own term (Wilson 1978), but Megill uses it to define and analyse the features of a genre that he traces back to Robert Chambers and the *Vestiges of the Natural History of Creation* (1844), and perhaps having much earlier literary roots in the monads-to-people style cosmic epic of Lucretius (Lightman 2007). A principle feature of the “epic”, as Megill defines it, is that it is based on the assumption that history is ultimately rooted in biology, extrapolating from that to a unified narrative account of the world and of human nature. For Megill, this move is in Wilson’s case the unwarranted outcome of his inability to recognise the tension between his scientific materialism and his ontological commitments, and it places him in
the tradition of idealism and nineteenth-century positivism, which Megill in turn opposes to “the complete anti-idealism, aka materialism” of Darwin’s evolutionary proposition (Megill 2016, 29). I will take advantage of the entry point suggested by these historical lines of inquiry to examine how this epic narrative finds expression in Wilson’s ethical and epistemological conclusions about the implications of a Darwinian evolutionary perspective.

In *Consilience* (1998), Wilson would reiterate, in a more ambitious global argument, that an evolutionary social science was the key to developing a meaningful human ethics (Wilson 2006). In *Sociobiology*, Wilson had suggested that as individuals, organisms might account for almost nothing from an evolutionary perspective, and he argued that because of our increasingly complex and “autocatalytic” social evolution, the key to a stable human future might well lie in a more *planned* society (Wilson 1975, 575). In *Consilience*, he tied this sociobiological ethical perspective even more explicitly to the idea of human social evolution as on a collision course with the biosphere.

This was to continue to lay stress on the human organism as a *system*. Wilson is a writer highly sensitive to the intricacies and beauty of natural systems. Doubtless, a lifetime of studying ants, “locked into their chemosensory world”, and “existing in a fractal world of centimeters”, has given him more than usual exposure to the perspective of a regulated society of mass action and the ruthlessly policed division of labour (Hölldobler and Wilson 1994, 205). Wilson’s philosophical project is in fact indebted to ant colonies, “superorganisms” that “understand no mercy or variance given on their behalf, and will always be as *elegant* and *pitiless* as we now witness them, until the last one dies” (205) (my italics).

This antish perspective colours Wilson’s work (for further exploration, see Smith 2013), with its characteristic fascination with system-construction and the phenomena of sociality and eusociality in animals (Wilson and Hölldobler 2005). Importantly for Wilson’s project, biologically directed systems express
themselves at all “levels” of selection, scientific description and subjective experience. Wilson, in his writing on nature, moves between the inconceivably vast (historical evolution on the cosmic scale) and the tiny (the microwildernesses of insects and microbes) but without ever losing his intense focus on patterns and systems. Like Darwin, Wilson identifies himself drawing his principal scientific inspiration from his naturalist’s perspective (Tschinkel and Wilson 2014), and like Darwin, he paints a picture of human nature unfolding, particularly at its minute and its macrocosmic extremes, on scale that is not human. In Half-Earth, we find the elegiac invocation of the sweep of evolutionary time abutting an account of tiny life in the line of the tide wash on a beach, or the organisms of the human gut turning over in what appears to the human time-scale an eternal present. This sense of time and perspective operating in each organism’s specifically-experienced—but cosmically related—umwelt (its locally experiential world) also expresses itself in Wilson’s emphasis on biodiversity, and in his repeated warnings about the ecocidal dangers of our present anthropocentric perspective, in which we fail to perceive the way we relate to other intricately evolved and delicately balanced biological rhythms and realities. Hölldobler and Wilson write:

We are the first species to become a geophysical force, altering and demolishing ecosystems and perturbing the global climate itself. Life would never die through the actions of ants or of any other wild creatures, no matter how dominant they became. (1994, 206, my italics)

“Let us not despise the lowly ants, but honor them,” they conclude. “For a while longer at least, they will help to hold the world in balance .... they will serve as a reminder of what a wonderful place it was when we first arrived” (206).

Wilson has recently written that in fact, every living species is itself the shining culmination of an “evolutionary epic” (Tschinkel and Wilson 2014, 438). This chimes with Darwin’s emphasis in the Origin on “every production of nature” as having “a history” (484). Darwin had used the natural history of earthworms to
gently chide his readers that the very soil created by their blind instinct, barely remarked upon by the humans so dismissive of their ancient otherness, existed as a silent challenge to human conceit and self-importance. Wilson similarly uses ants to press home a moral point about human relevance: in this case, that the biosphere supporting the vast diversity of all life is the high stake in our single species’ metaphysical gamble.

Wilson would write in *Consilience* that humans have a Faustian choice between unchecked expansion and the biosphere that supports life. This draws a particular message from Darwin’s theory of the evolutionary origins of morality: the question of what is right or wrong—the moral content of our choices—is inseparable from the question of how humans act in the world. Wilson’s implication is that the ethical choice is identical to the action that would ensure the future survival of the human and other species. So ethics operates in a collective, not an individual, domain, and its essence is not individual thought, but rather, species-oriented, and ultimately, plant-oriented, action.

Wilson argues that there is a major problem faced by the human species as it tries to investigate itself scientifically, and it is a problem about our collective meaning and purpose. This problem is our species’ conflicted self-image. We have, on the one hand, a “naturalistic” image of ourselves—holding that we live in a “razor-thin biosphere within which a thousand imaginable hells are possible, but only one paradise” (2006, 310). Idealising nature, we are exquisitely sensitive to, and emotionally compelled to want to re-create, “the peculiar physical and biotic environment that cradled the human species” (2006, 310). This is in conflict with a powerful “exemptionalist” image of humanity—in which to be human is to be, by definition, something distinct, outside of the ordinary constraints of nature. Wilson thinks this exemptionalist view has been the prevailing and guiding theme of the Western cultural tradition. The culture’s canonical metaphysical texts and beliefs have instilled in us the idea that the very essence of humanity is that we are a species apart from the natural world, holding
dominion over it (310). For the committed exemptionalist, “few limits on human expansion exist that our special status and ingenuity cannot overcome” (311).

These conflicting images are also collective stories, not about individuals within the species, but shared by the species as a whole.

It might be tempting to read this as simplistically pitting a Romantic holism against the environmentally destructive ethos of human bigotry. In fact Wilson’s aim is something quite alien to the Romantic spirit. It is instructive that Wilson does not use the term exception. Exemption is a far stronger term, suggesting that on the species-apart view, we are not simply exceptions to natural laws—but granted a freedom from any claims nature and its laws may have over us. As Wilson points out, this is a wholly, and an extreme, metaphysical claim. But this view is also one we have so naturalised and internalised through our cultural history that its extremity goes easily unperceived by us. I have argued in previous chapters that even philosophers fully committed to a naturalistic and secular worldview can fail to perceive the extent to which the “exemptionalist” account exerts its mythic power over our own beliefs about our psychology and our agency.

Wilson does not claim that the solution to the dilemma is to seek to return to some prior, biologically innocent, Paleolithic state. His claim is that we might be able to resolve the dilemma by a different means. If we can reduce the extent of our ignorance about human nature, we may be in a position to “decide the ultimate question: to what end, or ends, if any in particular, should human genius direct itself?” (310, my italics) Behind the everyday verb “decide” is a claim of vast and colonising ambition, and a revealing assumption about human psychology.

Wilson insists that all genuine knowledge is ultimately empirical scientific knowledge. This is the central claim of Consilience. Huxley thought something like this too. But the boundaries Wilson stakes around the possibilities for
empirical knowledge are far wider than those of the doubting nineteenth-century agnostic Huxley. According to Wilson, all that can properly be called knowledge is in the final analysis identical with nature's fundamental laws—a “webwork of causal explanation that runs all the way from quantum physics to the brain sciences and evolutionary biology” (2006, 137). For the systematiser Wilson, “Dionysian spirit” is not the elemental other to “Apollonian law” (137), as Nietzsche had preached at the height of his exuberant youthful Romanticism. Rather, Wilson thinks that art and science, and poetry and prose, are equally targets for empirical explanation, because all kinds of explanations about what it is to be human (indeed, to be anything at all) can be captured in this causal webwork.

He also thinks that the desire to search for this kind of knowledge is itself, a constitutive part of our evolved human nature: “we must know, we will know” (47). Although we are, literally-speaking, neither lords nor gods, natural scientists, Wilson has recently written, live for a “Lord God moment” in which they might sense their full causal connection to the cosmos in the glimpse of a rare bird (Wilson 2016, 99). This is an imperious worldview, and one into which he sweeps even “postmodernists or their rebellious equivalents” (2006, 46) who have, on Wilson’s view, made a fetish of scepticism about science, and a celebration of existential submission to the authority of the cosmos. For Wilson, the doubter operates as a foil, to use another literary term. Scientists will always need their doubt, he writes—“For what better way to strengthen organized knowledge than to continually defend it from hostile forces?” (2003, 46)

Sapere aude!—“dare to know”, as Kant declared in the famous phrase of an earlier Enlightenment. To get there, Kant had to cleave the world as it is from world as the mind knows it, methodically. The problem for Wilson’s consilient, Darwinised Enlightenment is how, or what, can we “know” if what we are learning is that our evolved human brain is imperfect and incapable of being perfected—if it has been “assembled not to understand itself, but to survive”
Wilson’s answer is that much of our metaphysical baggage must be jettisoned as unsuitable to take us on this heroic, scientific journey into the conflicted human brain.

Myth and self-deception, tribal identity, and ritual, more than objective truth, gave [historical human cultures] the adaptive edge. That is why even today people know more about their automobiles than they do about their own minds—and why the fundamental explanation of mind is an empirical rather than a philosophical or religious quest. It requires a journey into the brain’s interior darkness with preconceptions left behind. The ships that brought us here are to be left scuttled and burning at the shore. (106)

We are a species whose very identity arises from psychological conflict: “brilliant” and “emergent” (333), but simultaneously, a primate, dark with obscure urges. In this, we are neither cursed nor blessed because these terms are, themselves, the product of an older metaphysics—a way of thinking no longer open to us. So Wilson re-interprets an old theological dualism in naturalistic terms: as he would put it in The Social Conquest of Earth, “the dilemma of good and evil was created by multilevel selection in which individual selection and group selection act together on the same individual but largely in opposition to each other” (E.O. Wilson 2012, 241).

Wilson argues that the survival of the human species depends on recognising something counter-intuitive to our experience of ourselves: we are not in fact, a whole self, but an innately conflicted patchwork of biochemistry—and not just our own individual chemistry. Our imperfectability is the quality that has made us: in a constantly changing environment, it was, paradoxically, our imperfection and flexibility that could provide multiple opportunities for adaptive advantage. But the present state of our species, and of each human as an individual entity, are both the result of “the aggregate choices of many brains” across “evolutionary time” (2006, 182). We are, in this sense, an evolutionary collective. The properly ethical—the only ethical—question is whether we will, through “a habit of careless discursion in the name of progress” (333), bring about our own ruin,
decide to collectively act differently, based on a genuine comprehension and acceptance of what sort of animal we are. Wilson thinks we can act differently, if use our love of knowledge and our capacity for reason to learn “what we truly are” (Wilson 2012, 297).

7.5 “Functional organisation at the planetary scale”

David Sloan Wilson is another who has pinned hopes for a better future on a sociobiological project that emphasises ethics as needing a collective aim. The two Wilsons acknowledge that as an evolved species in novel circumstances, our individual behaviours can be, in some circumstances, benign but in others, pathological. But although their evolutionary views are quite distinct, they have this in common: optimism about the possibility we might rationally use knowledge about human evolution to shape a better collective “destiny”. D.S. Wilson and colleagues have recently argued that we can use our understanding of evolutionary biology to channel our capacity for altruism to develop less destructive social formations, by harnessing insights from evolutionary biology and psychology. One of these insights, Wilson suggests, is that new understandings in evolutionary biology may challenge the assumptions of neo-liberal economic theory that have erroneously and destructively led us to emphasise humans as individual self-interested and rational actors (Gowdy, Dollimore, Wilson and Witt 2013; D.S. Wilson 2015).

In an account of cultural evolution that D.S. Wilson has recently offered (D.S. Wilson 2015), the social organism becomes an entity supposed to have the kind of existence that would allow it to be rationally engineered to capitalise on our capacity for other-oriented behaviour—albeit that paradoxically, this might mean engineering it to take account of individually non-rational behaviours. He wants to challenge the “fundamentalism” that has convinced people that “the pursuit of self-interest is morally pure and will benefit everyone in the long run” (113). His claim is that this paradigm has no authority from biology, because “nothing as
complex as a large society can organise on the basis of individual greed” (114). Sociality, not individual expression, is therefore the evolutionary key to cohesion. He thinks that the upshot of this is that avoiding social dysfunction requires rejecting the idea that evolution is an inherently selfish process, and “bringing together” the levels at which selection operates in the evolutionary process: the genetic, the individual, and the social. We may then be able to build “social environments that cause prosociality to succeed in a Darwinian world” (131) (my emphasis). In other words, D.S. Wilson thinks it would be possible to harness the evolutionary fact of altruistic behaviour to engineer “functional organisation at the planetary scale” (139), and achieve a new kind of human society.

These kinds of ambitious projects seem to gain an added and poignant dimension in the Anthropocene, where more than half of the world’s natural resources are now diverted to the service of Homo sapiens (and to those bonded species we systematically press into human service). Safa Motesharrei, Jorge Rivas and Eugenia Kalnay (2014), for example, have recently modelled the relationship between resource use and social inequality, and the risk of social collapse. Their sobering modelling is based on a ‘predator-prey’ model, in which for this case, the natural resources of the human environment are taken as the prey while the human population functions collectively as the predator—with one key caveat. In most animal populations, when a predator outstrips the carrying capacity of its environment, certain effects—like starvation or migration—ensue. However, we humans have an unprecedented capacity to accumulate surplus resources, so this delays the effect, allowing us to continue to strip natural resources and accumulate them without its impacts yet being felt. One confronting assumption in their modelling is that the effects of technology on resource use are not unidirectional, since technologies themselves—whatever efficiencies they might achieve—ultimately tend to increase the extraction and consumption of resources. The authors argue that one of the significant risks in previous social collapses is extreme economic stratification, and the intense accumulation of resources in small parts of the population. Collapse may simply come down to
the dynamics of complex social organisation. On this picture, not only does the presumption of individual agency at some point become irrelevant to the outcome—it becomes the problem.

We are *habituated* to think of ourselves in an individualistic relationship to the social body. Our cultural narrative places a great emphasis on ethics as a set of individual practices, based on the intuitive assumption that our private actions exert a power, which we derive from the subjective experience of ourselves as moral agents, a message reinforced across human cultures. Our private actions do, indeed, exert power—but frequently, the outcome doesn’t express our intention, and the social consequences are not foreseen. The common thread, then, in the faith of the two Wilsons—and my reason for drawing them together in this dissertation—is that this disposition may be just a habit of thought, and if we can break it, perhaps we can decide to act differently.

E.O. Wilson assumes we must start by empirically inquiring into the human species using the tools of evolutionary biology. If we can demystify ourselves, we may realise that we can act in a different way. This, he thinks, is the collective goal of a consilient molecular biology, cognitive neuroscience and sociobiology. At this point, however it becomes clear where, in Wilson’s project, science cedes primacy to hope, and empiricism gives way to grand speculation. For we may well ask on what basis we should conclude that it follows—as Wilson surely *hopes* but cannot *know*—that if we pursue this goal of knowing ourselves scientifically (insofar as we are able), we might “feel more disposed to reflect on where we want to go” (E.O. Wilson 2006, 332), and to act wisely and collectively in the light of our unified scientific knowledge. For John Gray, this is indeed “faith, not science” (2003, 3)—and the empirical evidence from human behaviour to date is not promising. Wilson’s faith is staked on the claim that to an extent, at least, the way we think is habitual—and that these habits of thought may, if we see them for what they are, be broken. We need to see ourselves as though we were myrmecologists describing the “evolutionary epic” of the human species.
Darwin had argued that once-beneficial habits could be hardened and instantiated in future generations—in some cases, through direct inheritance. Tellingly, he had suggested in *Descent* and *Expression* that distinguishing between behaviours that are innate or instinctive and those that are learned or habitual would be very difficult. He speculated that the truth, in any one instance, could turn out to run counter to our intuitions. On one level, E.O. Wilson’s diagnosis is undoubtedly correct: *habit* is a practical, not just a theoretical, problem for the human species. Like Adam Phillips, he surely gets the implication of this correct: the habits that sustain us may simultaneously be those that are deadly (Phillips 2009). This leaves us far from Wilson portrayed by the early critics of *Sociobiology*, some of who thought his vision amounted to no more the confirmation of an existing socioeconomic paradigm. It leaves us with a different kind of problem: is Wilson’s vision actually possible? How does this claim that we can rationally apply empirical knowledge to arrest our present course of action as a species square with his assessment of human nature as “the inherited regularities of mental development common to our species” (2012, 193)—epigenetic rules, some of which are very ancient? How does freedom emerge from the biogram? It seems an unresolved ontological and indeed, scientific, contradiction for Wilson’s project.
8. SEEING ANIMAL

8.1 ‘Homo rapiens’

John Gray’s answer to E.O. Wilson is simple and short: freedom does not emerge from the biogram. Freedom of the sort Wilson imagines is not possible, and nor is a “human biogram”. The idea that empirical inquiry into the human organism might yield D.S. Wilson’s “functional organisation at the planetary scale” would also represent the delusion of an accidental species fundamentally lost to itself, but terrified by the truth of its epistemic boundedness and psychological opacity. Gray’s *Straw Dogs* (2002) and *The Silence of Animals* (2013) excoriate humanist philosophers as a class for what Gray thinks is their failure to admit in full the implications of the statement that “Darwin has shown that we are animals” (Gray [2002] 2003, xi). For Gray, the humanist “orthodoxies” of most moral philosophers, and the majority of natural scientists, are products of that failure of imagination.

*Straw Dogs* argues that the prevailing tropes of moral philosophy and what Gray calls Darwinist orthodoxy are thoroughly saturated in still-unquestioned faith in the possibility of moral and economic progress or the sanctity of life. These are ideas that he thinks are untenable, if we take the implications of being a product of evolutionary common descent seriously. Gray paints these hopes as mocked on a daily basis by a human animal for which acts of genocide come as naturally as postures of prayer. Science—the only area where Gray will admit that anything occurs which might be allowable called progress—tell us we are not gaining in self-awareness, much less on the verge of some state of knowledge from which we might collectively act to author our species’ own future. We are not even “authors of our own lives” (109).

Personal autonomy is a figment of our imagination, and “species cannot control their fates” (3). Gray thinks admitting this position deals a death-blow to moral
theory, but that is “the only possible ground” (II2) of ethics, because if we were, in fact, monads locked up in autonomous selves, we would be incapable of the fugitive empathy for others which is all we have, and on which ethics itself must ultimately rest. This suggests that ethics is the province of art, social accident, and aesthetic sensibility, rather than science. The problem is not that ethical philosophers have previously looked in the wrong place for moral certainty, argues Gray—but the search for moral certainty itself. There is and can be no moral certainty. We could live more lightly—more like the animals we really are—if less burdened by moralising, but we cannot return to the innocence of a “purely spontaneous existence” (I16). Influential moral philosophers have “avoided inspecting their moral intuitions too closely”. Perhaps, Gray adds ominously, “this is just as well” (I02), because scrutiny would reveal that our supposedly conventional moral beliefs often have a short history, and our actions are frequently without the intent on which the meaning of their morality is supposed by most philosophers to hinge.

Gray shares Huxley’s conviction that the escape from pain and suffering is no object for human life. But whereas Huxley could still make science a moral calling, Gray goes further, urging that we should relinquish the very idea of objects for human life at all. He argues mercilessly: “Nearly all philosophies, most religions, and much of science testify to a desperate, unwearying concern with the salvation of mankind” (I51). But Gray thinks that an understanding of our place in the world since Darwin requires asking why our species—which he dubs, in startlingly violent terms, Homo rapiens—should be thought worth preserving at all.

Unlike naturalistic philosophers including Daniel Dennett, Gray will not have even compatibilist talk of “free will”. And he gives no shift to attempts to derive a systematic ethics, or the rational basis for a new theory of political organisation, from an evolutionary perspective. There is no point, he thinks, chasing down the origins of our moral intuitions—we will merely find that for all they are intensely
felt, they “are also shallow and transient to the last degree” (102). But rather than face this, we invent moral fictions that allow us to cling to the convention and belief that there might be a rational alternative to these flawed, unfounded intuitions. We delude ourselves with stories of human value, and of human virtue. Worst of all, Gray accuses, we hide from the fact that our actions are necessarily morally ambiguous and opaque—increasingly so in a complex social world in which act and consequence do not relate in any direct or authentic way. On this reading, the way to salvation through political action is similarly barred.

Humans thrive in conditions that morality condemns. The peace and prosperity of one generation stand on the injustices of earlier generations; the delicate sensibilities of liberal societies are fruits of war and empire. The same is true of individuals. Gentleness flourishes in sheltered lives; an instinctive trust in others is rarely strong in people who have struggled against the odds. The qualities we say we value above all others cannot withstand ordinary life. Happily, we do not value them as much as we say we do. (Gray 2002, 107)

Gray begins *Straw Dogs* with an appeal to Darwin, but he is by no means in the business of applying Darwinian principles to search out an alternative reference point on which to construct a systematic or naturalistic *theory* of ethics. He uses Darwin as instrument of *deconstruction*—or rather, as a destructive weapon. Gray states this quite directly: he wants to employ Darwin strategically, to “break up the prevailing humanist worldview” (xii). In this task, “neo-Darwinian” orthodoxies are as much in his sights as religious beliefs. In aiming for this target, Gray rolls Darwin’s theory of descent up into subsequent historical and scientific developments upon it as though they were of a piece. But surely, whatever Darwin’s formulation of evolutionary common ancestry may have suggested about humans, it was not that we were “assemblies of genes” (4). And if Darwin curtailed hopes for progress, and foresaw it as a difficult project, he himself was not yet prepared to state that he had fully relinquished its possibility.

Gray’s complaint against present (so-called) Darwinian “orthodoxies” is that they are as indebted to myths of salvation as any variety of Christian belief: the secular
myth of progress, with science as the saviour. Gray wants to do away with salvation of any sort. The effect of all this is to lock the human animal into an intense stranglehold with its own biology—one in which human action is denied the legitimacy of meaning in both its everyday sense, and on a much stricter scientific interpretation of the meaning of that term. It’s not just that our actions don’t have the meaning we commonly take them to have. Humans don’t “act” at all, let alone in “humanity”. There is no “humanity”, only “humans, driven by conflicting needs and illusions, and subject to every kind of will and infirmity of judgement” (12).

Gray remorselessly pursues this point to the conclusion that humans are nothing less—but crucially, nothing more—than a rapacious and successful primate whose advance has everywhere coincided with ecological devastation. Straw Dogs is pervaded by a stark Gaianism in which “epidemiology and microbiology are better guides to our future than any of our hopes and plans” (9).

Gray is also scathing of the hope that we might ever tame technology to benign or humane ends, because “technical progress leaves only one problem unsolved: the frailty of human nature. Unfortunately, that problem is insoluble.” (15) Later, he suggests that

like us, the talking machines of the future will find themselves saying more than they can ever tell ... the digital world was invented as an extension of human consciousness, but it soon transcended it. (188)

Gray dismisses E.O. Wilson’s suggestion of “volitional evolution” (Wilson 2006). This, Gray shrugs, merely shows our psychological inability to live with what Darwin “discovered” (Gray 2004, 6): that we are “adventitious creatures, the result of blind evolutionary drift” (5).

Philosophers of biology emphasise that central to the long human career has been the fact that we are inveterate social learners, and this has helped us adapt
to environmental extremes: inland deserts, shallow seas, fluctuating seasons, abrupt climatic shifts, and natural catastrophes (Klein 2009). The essence of adaptive social change and increased social complexity has been specialisation, stratification, and above all, investment in cultural learning, instantiating in the human species a ceaseless greed for information (Sterelny 2012). E.O. Wilson has taken this drive as the key to the species’ future survival. Gray thinks that it is this hunger for information, its greed sharpened by the accidents of history, which is now—far from our greatest asset—our greatest threat. To be gorged with information is not to comprehend. Humans have emerged from the forests, says Gray, to a world of mirror halls in which the blunt, accidental instruments of human learning—far from liberating humans from their ancestry—have simply become a source of increasing confusion.

New technologies are creating a new wilderness, a realm that humans can wander in without ever understanding. The emergence of a virtual wilderness does not compensate for the loss of the earthly one that humans are destroying, but it is like it in being unknowable by them. (188)

Gray concludes that Paleolithic humans were better off—presumably because on this reading, they were unburdened by the problem of being human at all.

8.2 Being human at all

The statement from Gray cited above is one of those strains of thought that suddenly reveals the radical gulf in the ontological landscape between our present time and that in which Darwin wrote. Darwin, in his encounters with the Fuegian “savages” in the earthly wilderness of Tierra del Fuego, was struck by what seemed to him the fragility, and the provisionality, of their humanity. Far from seeing them as free of the moral burden of being human, Darwin took it that their intimate proximity with nature made them morally vulnerable. They existed on the cusp of an almost-animal state—and sometimes, slid into it. They were painted but naked, coiled against the sleet, clinging tentatively to the
edge of a hostile world, in small bands connected by only the slenderest bonds of sociality. They were also intimately bound to the physical demands of their natural environment, which could lead them to dark and, for Darwin, ethically troubling, practices.

The “civilised” races, so Darwin would claim in *Descent*, were—like domesticated animals—less reproductively vulnerable to changing conditions of life. Whereas “if savages of any race are induced suddenly to change their habits of life, they become more or less sterile, and their young offspring suffer in health in the same manner, and from the same cause, as do the elephant and hunting-leopard in India” (Darwin 2004, 220). Darwin argued that this might be a more significant threat to their future survival than introduced disease or colonial warfare. This view might possibly sound, to a modern reader, like a dubious attempt to downplay the obvious violence of the colonial enterprise, but it is an interesting alternative to view this idea as the product of a culture in which other lines of inquiry were not yet open to Darwin.

In finding in “savages” the counterpart to wild animals, while “civilised races” found their counterpart in domesticated species, Darwin was in fact suggesting that the extinction of races was in many cases implied as a direct consequence of natural laws governing variability, reproduction, and evolutionary change in species. Here is one of a number of points in his writings where the explicit conclusions that Darwin drew from his theory of descent with modification are genuinely confronting to the ethical sensibilities of modern readers. Moreover, because this historical claim is both discomforting, but untenable on modern evidence, we might tend to overlook how central it was to Darwin’s own conception of how the evolutionary process operated in the human species. This is not something that requires a comforting resolution to be supplied by the contemporary reader of Darwin—either through declaring him a “racist”, defending him from the meaning of his own conclusions (as if he had not drawn them), or resorting to soothing banalities of the “he-was-simply-a-man-of-his-
time” sort. It is more historically revealing to look at what Darwin’s line of theorising here reveals about the deeply uneasy relationship he had as a colonial Englishman with the human societies beyond the acknowledged bounds of the “civilised” world. These people could be an exotic discovery—like any species of animal. But they could also be something that animals could not: as human victims of colonialism, they could morally accuse. Neither fully other to the “civilised” Europeans, nor admitted by Europeans as the same, the “savages” emerged on the pages of the Descent as expression of an anxiety that profoundly underpinned the response to Darwin’s proposition about common ancestry in the nineteenth century: the fear that he had revealed being human at all to be a provisional and impermanent kind of thing. Were humans no more than a natural occurrence, an event in time, with no more moral status in the world than dogs, or worms? To ‘quote’ one persistent if, probably apocryphal response to this proposition, attributed with minor variations to several bishops’ wives and at least one “timid and decorous spinster”, “Let us hope it is not true, but if it is true, let us hope it does not become widely known” (Horton 1893, 132). 38

8.3 Possible kinds of freedom

E.O. Wilson’s historical urge and perspective may be cosmic, but his ambitions for the human species are not. He banks everything on the hope that, as he put it in The Social Conquest of Earth, we will rise to the challenge implied in being “alone on this planet with whatever reason and understanding we can muster, and hence solely responsible for our actions as a species” (E.O. Wilson 2012, 294). This also means shedding the last of the “cosmic myopia” of human exemptionalism—abandoning ideas such as the “delusion” of colonising other planets. In the Social Conquest, he therefore concluded a tale that had taken the reader from deep evolutionary time to the frontiers of bioscience in a strikingly

38 The actual source of this well-known ‘quote’ is not clear. Horton’s “spinster” gives it as “Let us hope it is not true, but if it is, let us hush it up.” In other variants, it is claimed that the words were those of the wife of an English canon, sometimes named, and the final part is often given as the more familiar (and perhaps more witty) “let us pray it will not become generally known”. Those keen to trace the origins can find some interesting although possibly not exhaustive speculation and links at http://quoteinvestigator.com/2011/02/09/darwinism-hope-pray/#return-note-1926-5.
novelistic and conservative way—with a happy ending of quiet domestication, almost wistful in its plea.

It would be enough to settle down and explore the limitless possibilities for fulfillment on the home planet. Earth, by the twenty-second century, can be turned, if we so wish, into a permanent paradise for human beings, or at least the strong beginnings of one ... Out of an ethic of simple decency to one another, the unrelenting application of reason, and acceptance of what we truly are, our dreams will finally come home to stay (Wilson 2012, 297).

Megill (2016) suggests that the problem with the modern “epic” of evolution is that it is the outcome of a narrowing twentieth-century division of intellectual labour in which scientists may be less aware than in generations past of how their ontological commitments and suppositions may influence the claims they make in their legitimate sphere of knowledge. Paul Sheldon Davies has put the problem a blunter way: many philosophers and a lot of scientists remain in thrall to concepts dubious by metaphysical descent. Investigating the concept of our human agency, he has concluded that recent scientific evidence is not promising for “our traditional humanistic concept of moral responsibility” (Davies 2009, 225). Davies draws attention to experiments in psychology that suggest that our best psychological theories are “against” freedom of the will, and with recent developments in the sciences of the mind, “less and less of our experience speaks in support of free will” (141). He paints a picture in which, piece by piece, research is challenging our most cherished beliefs—the perceptions of causal interpretation, for example, may be an illusion of the architecture of our psychology (Wegner 2003), since in experimental situations, it can be shown that we in fact can have the experience of willing our actions after we have acted.

Even pioneering thinkers like Daniel Dennett, according to Davies, rather than give up the illusion of being a consciously willing agent, argue that we should make peace with it—because it is the illusion that makes us human. Davies says
we should reject even that concession as an idea dubious by its metaphysical descent.

We do not know what kind of freedom, if any, we have. This is not to deny what is surely obvious, namely, that we have very strong convictions and beliefs concerning human freedom and responsibility. But we know that the authority of these convictions and beliefs must be withheld precisely because they are so stubborn. (Davies 2014, 225)

We cannot relinquish our overweening confidence that “sometimes we are unfettered centers of command and control” (225). We are almost certainly wrong, he suggests. What follows from a naturalistic and evolutionary perspective is not a neat set of conclusions closing in on the goal of a peaceful self-consciousness, but simply an orientation for further inquiry—one that eschews philosophical concepts dubious by their metaphysical descent. In a personal note at the conclusion of this work, Davies writes this:

Our constitutional conflicts even include the naïve conviction that we are free of such conflicts ... The only consolation—if that is what this is— is that at certain moments, if we are lucky, we get to know a few truths about the world, and then, at other moments, if we are lucky, our imaginations go to sleep and we ... get lost in the convulsing intelligence and beauty of new and ascending life (241).

Babies are not born—as John Gray remarked of animals—“pining for a deathless life”. We return to where we started, with Freud’s ambivalence, heightened by Darwin’s thesis of what John S. Wilkins and Paul Griffiths have surely correctly called our epistemic boundedness (Griffiths and Wilkins 2015). Darwin himself gave no hint that he thought the human species could break free of our deep historical past. Rather, he suggests the opposite—we are a production of that history, which sets limits on what freedom can be. Just where he thought the limits might lie, or what form they might take, has been the subject of endless speculation since. What, if anything, does freedom look like in a Darwinian
world? Gray suspects that if freedom lies anywhere, it lies in accepting there may, in truth, be no grander aim in life than simply “to see” (Gray 2003, 199). A characteristic in the discourse of evolutionary naturalism, then, may well be said to be that there are those philosophers who have taken the view that we must learn to live with the ambiguities of Darwin’s thought, and those who wish to resolve them.
CONCLUSION: READING “MONKEYS” FOR A PREEXISTENT SOUL

A strong song tows us,
long earsick
Blind, we follow
rain slant, spray flick
to fields we do not know.

BASIL BUNTING

Our ancestry is a strong song, impelling us obscurely from the deep past to a future we cannot clearly see. Darwin clearly perceived the source of this obscurity in the Descent. An experience such as a feeling of religious awe, or a particularly strong moral instinct, might feel quite natural. But investigating the origins of these feelings scientifically, Darwin perceived how difficult it was to distinguish something that we might call innate from that which was a product of the powerful, constructive pressures of human culture, both natural, and at the same time, naturalising what they constructed. Phenomena such as the moral sentiments were, in fact, the combined result of a number of processes acting together: “the strengthening of our sympathies by habit — example and imitation — reason — experience, and even self-interest — instruction during youth, and religious feelings” (Darwin 2004, 163). For Darwin, the key to understanding this from an evolutionary perspective was to focus on processes, rather than on the specific content of any one expression, moral belief or instinct. But we humans are not just a product of our evolutionary past. That past has also developed in us an exquisite sensitivity to the idea of the future—even if the evidence so far shows us to be poor prophets.

In concluding this dissertation, I want to focus for a moment on the significance of some specific conclusions of Darwin’s works. Darwin’s most famous conclusion is that of the Origin, where he conjures the familiar scene of a country embankment, entangled with growth and abuzz with birdsong and industrious insects, each acting according to nature’s laws. Yet he did not let his readers
forget that the “endless forms most beautiful” in that comforting idyll emerged from “a Struggle for Life ... Natural Selection ... the Extinction of less-improved forms ... the war of nature ... famine and death” (1859, 490).

In the conclusion to *The Variation of Animals and Plants under Domestication*, Darwin pointed to how the plasticity and variability of organisms and the ceaseless struggle of living things to survive and reproduce must surely throw into doubt the traditional reasons for assuming the existence of an omniscient and omnipotent creative Author. He then brought this to bear very directly on the problem of the *human* organism. “Thus,” ran his concluding sentence, “we are brought face to face with a difficulty as insoluble as is that of free will and predestination” (Darwin [1868] 1998, vol. 2, 428). The “we” in the sentence was strategically significant. It was also a typically Darwinian textual technique. Darwin was inviting his readers to join him, to follow his gaze in the direction in which he had so steadfastly held it for more than half his life.

In *Descent*, he hauntingly reminded readers that they bore in their bodies “the indelible stamp of [man’s] lowly origin” (2004, 689). These final seven words have a quiet insistence that (as so often with Darwin’s writings) belie the incendiary proposition beneath. The famous phrase operates on one level as a simple statement of our physiological and anatomical continuity with other animals. But it bears much more cultural meaning. It contains a thesis in human psychology. It raises disturbing questions about man’s relationship to nature. By making it the last line of his great study of descent, Darwin was refusing (just as he had refused in the last line of the *Variation*) to pretend that the questions raised by his theory of common ancestry had easy answers. This phrase also warns against something in the human character well known to poets and philosophers since at least Homer: our tendency to hubris. Just as the message of the great Greek tragedians was that men were not gods—that the gods were radically indifferent to human endeavours or interests—Darwin seems to suggest that we should be sceptical, or, at the very least humble, about the limits of our
possible knowledge and the importance of our place in nature, because we bear the stamp of being nature’s accidents. And the final phrase of Descent also gives us cause to wonder just what obligations we might have to other animals—to the “humblest living creature” (689)—whose own struggles had in turn generated the biological possibility of human lives, and whose obscure origins we ultimately share.

In the conclusion of his book on earthworms, Darwin drew attention to the moral significance of those humbler creatures, and their constructive daily and nonhuman toils. Worms, though poorly endowed with sense organs, nonetheless ploughed the fields and created the soils that preserved (or did they mock?) the past glories of human civilisations. Corals had “constructed innumerable reefs and islands”. It may be “doubted whether there are many other animals which have played so important a part in the history of the world, as have these lowly organised creatures” (Darwin 1883, 316).

My own conclusion from studying these conclusions is that Darwin perceived very clearly the extent to which his theory of ancestry threw into question much that humans had cherished. They undermined notions of human significance, curtailed the claims for free will, and instantiated suffering as a necessity for life. Finally, and crucially, he had comprehended that the nature of our very being, as a product of descent with modification, was such that the human species would be the most radically difficult being to penetrate and investigate—and the problem would be, in part, our own psychological and epistemic boundedness.

My readers of Darwin had this in common: they concluded that coming to terms with the human species as a natural occurrence—which all assumed to be necessary to securing the future of our species—meant being open to shedding some of our most fundamental assumptions about what we are like and our place in the world. They sometimes drew back at the brink, for different sorts of reasons. Testing the limits of naturalism is a serious philosophical project, but
also, a difficult one. For Huxley, Engels, and E.O. Wilson this inquiry still remained tied to the possibility of human progress. This was tempered for Huxley, by the limits evolution placed on our epistemological access to the world, and for Wilson, by the constraints of epigenetic rules (though he has imagined at times that even these, in the future, may be susceptible to the possibility the could be transcended by rational inquiry). Singer, longing for moral certainty, constructed a philosophical system to deny the pass from a naturalistic account of morality as an evolutionary product to a moral scepticism. As a result, the suffering to which his philosophy is so opposed becomes, in fact, the vexed and unresolvable centrepiece to all his thought.

Huxley’s response to suffering would be simply to recognise that it could not be eliminated, and recommend doing what “work of noble note” one could (using Tennyson’s phrase) to ameliorate its worst effects. More recently, Singer has recommended a radical utilitarian ethics based on doing “the most good” in the world. “Good” is defined as rigorous, charitable giving, based on the calculated, rather than the intuitive, value of any action (2016). John Gray, reviewing this work, questions Singer’s assumption that ethics can have the status of a rational science, but suggests that the problem may be deeper: “a world where human values [are] subjected to a test of marginal utility” and “a thin universal benevolence” would be an unattractive prospect (Gray 2016). Gray’s suggestion is that this, in itself, seems ethically questionable, according no value to the flawed and “fugitive empathy” (2003) between suffering and conflicted humans that is, on his reading, the only genuine basis for naturalistic ethics. For Gray, what Darwin told us when he “showed that we are animals” was that we must learn to coexist with ambiguity, doubt, and suffering, relinquish freedom as a genuine goal, and content ourselves with no higher purpose than “to see” (2003, 199).

Darwin’s own questions, his ambiguous, and tentative responses, and his blank silences, are most productively understood not as gaps to fill in or paper over with unquestioned assumptions, but as invitations to new ways of thought. Many have tried to fill Darwin’s silences and with more certain kinds of statements—
the claims about what kind of species Darwin made of us have been many, and have ranged from the insightful to the preposterous to the insidious. I have concluded—like Paul Sheldon Davies—that we still do not know what kind of a species we are. We may be, however, learning more about what we are not—not a rational, autonomous and unconflicted self, not a species outside of nature or radically other to the community of descent, neither able to control, nor exempt from, nature’s laws. We are not, in short, the creature that our cultural inheritance tells us that we are, or the being that we may feel like. Yet our convictions about this die hard—if at all, which seems to be the central problem for a project like that of Edward Wilson’s, compelling as its lofty aims may be.

Each of my readers has expressed these tensions in the natural picture of man differently. What emerges is, perhaps, as much a picture of their aesthetic sensibilities as it is a picture of their view of the scientific knowledge—and I have pointed to the ways in which Darwin’s own writings also emerged from strong sensibilities. Darwin had an uncanny ability to read the lines and layers, and crucially, between the lines, of the text(ures) of nature, and to synthesise what he read. Throughout his *Beagle* voyage, the many elements of what would come, over his life, to be woven into Darwin’s own philosophy of nature—extending from the stars to the sea bed to the minute details of the tiniest organisms—had been impressed on him. Darwin—like his Romantic hero Humboldt—was sensitive to the whole elemental text of the natural world, and even as he penned his strongest statements against a Romantic interpretation of nature, he never failed to acknowledge the profound power of the Romantic imaginary.

We can see this at work very strikingly in an evocative passage recording his time on the remote oceanic island of St Helena. Darwin had taken long exploratory walks on that volcanic island, rising “from beneath the waters … in the midst of a great ocean.” He contemplates its “wild valleys … desolate & untenanted”, and showing “the successive changes & complicated violence, which have in past times happened”. Darwin was plagued by the remote island’s “impetuous winds”,

blowing on its “wild sea beach & black utterly barren rocks ... places ... sufficient to ... poor men with ennui & melancholy” But there was tenacious life even there—small, lonely and immediate, heroically struggling to exist even on this oceanic upheaval of a measureless past. Standing on the edge of a plain terminated by a deathly cliff drop to the tossing vast South Atlantic, Darwin, standing in a pocket of calm, watched a tern struggling to remain airborne against the indifferent violence of the wind. “Approaching close to the brink I stretched out my arm, which immediately felt the full force of the wind ...”. Then Darwin turned and passed back across the island, where its “unique Flora” co-existed with the colonialists’ introduced partridges and pheasants, tracking back through cultivated fields, descending past forts and picket houses, along rudimentary goat paths, to pen the scene in his diary—the empirical record of a civilised nineteenth-century English naturalist on his voyage to the edges of the world. (Beagle Diary, July 9–13, pp. 429–30)

I have taken a particular interest in this work in Darwin’s diary entries and notebooks, and want, in concluding, to return via their crucial clues to our reading of Darwin. The notebooks can be read as a breathless clamour—the rapid, excitable association of ideas building upon impressions, and suggesting, in their form and texture, the associationist psychology that Darwin draws on. But every so often, among the discarded thoughts, the incomplete sentences, the gems of insight and the emotional exclamations of inspiration, frustration and exhilaration, one phrase strikes with peculiar force—for its strangeness, perhaps, or because it opens a sudden door to future ways of seeing. Importantly, the notebooks show how clearly Darwin had come to understand that the theory he was piecing together deeply conflicted with the basic assumptions that had hitherto underpinned human self-understanding, and why his life’s work would be to make of himself a careful rhetorician indeed. Darwin wrote:

Plato ... says in Phaedo that our “necessary ideas” arise from the preexistence of the soul, are not derivable from experience.—read monkeys for pre-existence (M128, 551)
Darwin did not ever state his full belief about what it might entail if monkeys were the source of our necessary ideas. In a modern phrase, perhaps, he did not yet know what kind of agent this would make of us. It is important to reflect on the fact that this did not make of him any kind of thoroughgoing cultural or political radical. Some others would come to see in Darwin’s ideas a means (Engels), or even a demand (Singer) to change something in the world—but Darwin had no urge to be a social agitator, and rested content with describing it. One might be tempted here to a conspiratorial view: in doing so, he surely preserved his social, financial and political advantage. But we can think wider. Perhaps, under the influence of the unique circumstances of his own personal and family history—in which religious dissent and unorthodoxy resided with bourgeois political power that was nonetheless always outside the Establishment—Darwin seemed far more disposed to be open-minded about the metaphysical implications of his theory than he was inclined (or able?) to question the necessity of certain forms and patterns of human social organisation. (Charles Lyell, baronet, lawyer and “Establishment” if ever a man was, could never bring himself to go all the way on natural human origins, opting in his Antiquity of Man (1863) to explain “man” by positing a saltational leap that preserved his ontological status, and leaving readers with a picture of “the ever-increasing dominion of mind over matter” [Lyell 1863, 506].)

Perhaps these competing commitments, and cultural and personal tensions, were for Darwin, highly productive—a source of the cognitive originality that seems particularly palpable on reading his notebooks. Yet Darwin simply naturalised many of the forms of social organisation he saw around him as a logical consequence of his theory of descent, frustrating other readers—both those critical of Darwin, as well as those who accepted his evolutionary views. I have already briefly discussed this in relation to his discussion of extinction, and his views about the treatment of nonhuman animals. It can be seen, too, in his treatment of sexual selection (E. Richards 1983). Among insects and in particular,
birds, Darwin gave the female selection of mates a powerful role in shaping evolutionary change. The females’ preference for mates was suggested as the evolutionary origin for phenomena including sexual dimorphism, courage, ornamentation, and musicality. But the “law of battle” between males also exercised a decisive role, and Richards describes how Darwin presented prevailing gender relations in Victorian Britain as evidence in favour of his theory. In human males, “Man ... more powerful in body and mind than woman” had “gained the power of selection”, wrote Darwin (2004, 665). It was now open to “woman” only to exercise a form of sexual power deriving from her consciousness of the “value” of her beauty (665), and a domesticated cultural and moral authority tied to her role as mother—in both these roles making femininity a crucial currency in the “economy of nature”. (Evolutionary psychology in some forms has been sharply criticised for preserving the form, if not precisely the content, of this argument.) Evelleen Richards’s work suggests that charging Darwin with being actively motivated by sexism is neither historically justified nor necessary (E. Richards 1983, 60). Darwin’s “woman” cannot be so easily decoupled from his commitment to a scientific and evolutionary account of human moral and mental capacities, nor from his personal history. However, Richards points out that Darwin’s critics, such as the feminist philosopher of biology Ruth Hubbard, have correctly identified that Darwin’s arguments exerted powerful political effects. They were enlisted, for example, to give scientific authority to hostility to feminism in anthropology and biology, and in arguments against the higher education of women.

Dramatic shifts in cultural attitudes to women, homosexuality, animal cruelty, or capital punishment over the years since Darwin wrote the Origin indicate that even our strongest moral intuitions can be susceptible to alteration by cultural and social forces (Sterelny 2012). Would such cultural changes have come about in the same manner if Darwin had not read “monkeys for pre-existence”? It would seem beside the point to speculate. Counter-factual histories of the sort recently written by Bowler (2013) might provide useful historiographical checks and
balances against hardening intellectual assumptions or implausibly off-track readings. But we have the history and the cultural circumstances—and the ancestral texts—that we have, and if counter-factual arguments have any role, surely that is to make us more careful, more diligent, more patient, and more sympathetic readers. If it makes as little sense to castigate Darwin by ascribing anachronistic political and cultural motivations to his writing as it does to lionize him as a heroic radical or revolutionary, yet he undoubtedly opened up a line of inquiry and an orientation that offered—indeed, if it were to be taken seriously required—a different way for us to talk about and think about ourselves. And he knew it. Darwin’s writing did indeed have the quality of canon-making strangeness. His theory of ancestry made us strange to ourselves. And others writing after have necessarily borne, or struggled with, the burden of that influence. Darwin clearly seems to have recognised that whatever we humans might actually be, it was likely to be counter-intuitive to what we thought we were like. His texts also show that he understood that in order to find out, we would necessarily have to confront many of the most stubborn of our convictions and beliefs—beliefs of a kind that “the history of Metaphysics shows ... cannot be, anyhow, easily overturned” (M135, 553). He also knew that the very stubbornness of our convictions was itself an evolutionary product, the stamp of our ancestral story. Darwin’s own view across those “fields” of new inquiry was not as clear or unimpeded as some like to suppose. As he had recorded in his M notebook, referencing Walter Scott with something like a sigh, “ideas come & the pulse rises, or as they flag & something like a snow-haze. covers my imagination” (M129, 551). It remained, to him, to be seen whether or how far the snow-haze might limit the penetration of the gaze of others. Meanwhile, “I have given the evidence to the best of my ability” (Darwin 2004, 689).
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