CAMBRIDGE

Cambridge University Press
0521771978 - The Cambridge Companion to Darwin
Edited by Jonathan Hodge and Gregory Radick
Excerpt
More information

JONATHAN HODGE AND GREGORY RADICK

Introduction

1 DARWIN AND PHILOSOPHY

Some scientific thinkers, while not themselves philosophers, make philosophers necessary. Charles Darwin is an obvious case. His conclusions about the history and diversity of life – including the evolutionary origin of humans – have seemed to bear on fundamental questions about being, knowledge, virtue and justice. Are we different in kind from other animals? Do our apparently unique capacities for language, reason and morality point to a divine spark within us, or to ancestral animal legacies still in evidence in our simian relatives? What forms of social life are we naturally disposed towards – competitive and selfish forms, or cooperative and altruistic ones? Once we adopt a Darwinian perspective, moreover, how should we respond to such venerable doctrines of the Western tradition as Aristotle's essentialism, Descartes' dualism of body and mind and Kant's rejection of the very possibility of a natural science of the mind?

The Cambridge Companion to Darwin aims to facilitate understanding of such issues. It provides an introduction to Darwin's thinking and to the various and often contentious uses made of his legacies today. To serve these ends, the volume departs somewhat from the precedents of earlier volumes in this series. The chapters come in four clusters, two broadly historical and two broadly philosophical. The first cluster concerns Darwin's theorising. The second looks at his setting, and the reception and influence Darwin had in his own time. The third examines Darwinian themes in such branches of current philosophy as ethics, social philosophy, philosophy of mind and philosophy of biology. The fourth offers examples of philosophers making up their minds – and not always agreeing with

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521771978 - The Cambridge Companion to Darwin
Edited by Jonathan Hodge and Gregory Radick
Excerpt
More information

each other – over Darwinian alignments for philosophical enquiries in the future.

This array of chapters does, we hope, provide a balance between the more enduring and the more ephemeral themes in Darwinian discussions through the decades. It provides, too, for mutual illumination between older and newer versions of the enduring themes. So, for example, the reader will find Robert Richards on how Darwin dealt with emotions and ethics, together with Owen Flanagan on how recent Darwinian studies of the emotions clarify the meaning of ethical statements. John Brooke tells of Darwinism and theism in the Victorian context, and Michael Ruse of Darwinism and theism today. Diane Paul looks at the relations between Darwinism and the old eugenics, while Philip Kitcher asks whether Darwinism can help us find a moral path through the new eugenics.

This companion aspires, then, to be introductory and synoptic, suited to any reader, whether philosopher or not, who is interested in Darwin. Nevertheless, the volume is specially adapted to the distinctive concerns of philosophers. The emphasis throughout is on concepts, contexts and controversies. As such, the volume cannot pretend to omniscience. Nor does it present authoritative consensus. On the historical side, there are divergences between those who see Darwin as a Romantic, and those who see him, at least as much, as a child of the Enlightenment. On the philosophical side, there are some who see limits to what philosophy can gain from Darwinian resources, and others who see no limits whatsoever.

II DARWIN, THE TREE OF LIFE AND NATURAL SELECTION

As an introduction to the first two clusters of chapters, it will be appropriate here to sketch the shape of Darwin's life and work. Born in England in 1809, Darwin had a privileged, private, local schooling. His father was an exceptionally wealthy and unusually free-thinking doctor, a prominent figure in the town of Shrewsbury, county seat of Shropshire, some hundred and fifty miles north and west of London. Darwin's schooling was followed by five years at university: two years' training in medicine at Edinburgh University; then, after a change of ambition, three years at Cambridge University, studying that mix of subjects, mainly geometry, theology and classical

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521771978 - The Cambridge Companion to Darwin
Edited by Jonathan Hodge and Gregory Radick
Excerpt
More information

literature, which then prepared one for a career in the Anglican church. Next came five years going round the world as a naturalist on HMS *Beagle*. Returning in 1836, Darwin – no longer wanting to be a clergyman and in any case too well off to need to work – lived for five years in London, where, in a series of notebooks, he developed almost all the theoretical insights he would later publish over the rest of his life. Finally, from 1842 until his death in 1882, Darwin lived in a Kentish village some sixteen miles south and east of London. For many years he did not go into print with what would be his most famous, even notorious theory, the theory of the origin of species by means of natural selection. In 1858, the biogeographer and specimen collector Alfred Russel Wallace sent Darwin an unpublished sketch of a very similar theory. Darwin then prepared an abstract of the big book he was still in the process of writing. The abstract appeared as *On the Origin of Species*, published in November 1859, while Darwin was hiding from the public in Ilkley, a spa town in the West Riding of Yorkshire.

The *Origin* expounds Darwin's general account of what would soon be called organic or biological evolution. Almost all of his subsequent, more specialised studies, such as *The Variation of Animals and Plants under Domestication* (1868) and *The Descent of Man, and Selection in Relation to Sex* (1871), can be read as amplifications or applications of the *Origin*'s two main proposals. The first was that all the species that have ever lived on earth may form a single tree of life. Any group of similar species – the gull species, say – is descended, in irregularly branching divergences, from a single, common ancestral species; and, further, all the bird species likewise are descended from a more remote single ancestral stock. Indeed, all animal and plant species may share a common ancestry when traced back sufficiently far in time. The second proposal was that natural selection has been the main cause or agency responsible for all this divergent, adaptive and progressive change from ancestral to descendent species: divergent in that many very different species often descend from a single ancestral one; adaptive in that, in the course of divergence, the ducks, say, have been fitted to diving and the hawks to swooping for their food; progressive in that adaptation has generally entailed specialisation, so that higher animals have more specialised parts – mouth parts and locomotive limbs where their oldest ancestors absorbed nutrients and moved themselves with their whole bodies.

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521771978 - The Cambridge Companion to Darwin
Edited by Jonathan Hodge and Gregory Radick
Excerpt
More information

Darwin called natural selection by that name to indicate an analogy with the selective breeding by humans of domesticated animals and plants, or artificial selection. This analogy, built up over the first four chapters of the *Origin*, deserves special attention, as the rest of the book amounts to a series of defences and applications of it. Roughly speaking, the first chapter, on 'variation under domestication', has two halves. (Page references in what follows are to the first edition of the *Origin*.) In the first half (7–29), Darwin argues that, when humans domesticate a species, new conditions of life are imposed upon that species, causing much new inheritable variation. In the second half (29–43), Darwin shows how human breeders have taken advantage of this inheritable variation, selecting for breeding, over successive generations, those organisms that happen to vary in desirable directions. Though the individual variations are slight – colouring slightly deeper, racing speed slightly faster, and so on – their gradual accumulation eventually results in new varieties, more closely matched to human needs and desires.

The next chapters shift the argument from domesticated plant and animal breeding to nature. The topics of inheritable variation and its selective accumulation are now dealt with separately. In the second chapter, on 'variation under nature', Darwin argues that, in nature too, there are changing conditions and hence variation, but the variations are much less plentiful than on the farm. In the third chapter, on the 'struggle for existence', he argues that, due to competitive struggle, inheritable variation accumulates selectively in nature too, but with the result that, over long stretches of time, much greater changes can be achieved than on the farm.

For the modern reader, one of these farm-to-nature moves is easier to assimilate than the other. Textbook versions of Darwinian theory still often include something about the small selectional achievements of the stockbreeder in comparison with the larger outcomes of fitness differences in nature. Much harder to understand nowadays is why Darwin fusses over the effects of domestication on variation versus the effects of natural environmental changes on variation. Even less comprehensible, from the point of view of the present, is why Darwin assumes variation under domestication to be more extensive than variation under nature.

Here we need to take account of some bygone biology. Unlike biologists today, and indeed unlike some biological thinkers at the

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521771978 - The Cambridge Companion to Darwin
Edited by Jonathan Hodge and Gregory Radick
Excerpt
More information

time, Darwin believed that variation was the exception, not the rule (43). Other things being equal, offspring resemble their parents. In Darwin's view, when offspring do not resemble their parents, it is because the parents' reproductive systems have suffered some sort of disturbance, due to changes in the conditions of life. How changed conditions disturb reproductive functioning Darwin does not claim to know – though he is prepared to conjecture that it has something to do with nutrition (7). But, he argues, once reproductive functioning has been thus disturbed, then, if viable offspring can be produced at all, they will vary. If conditions remain unstable (as under domestication), this variability will continue for generations to come. At least some of the variations will be, or will become, hereditary. As to why an organism varies in one way rather than another – a topic treated at length in the fifth chapter – Darwin argues that a number of causes come into play, including inheritance, reversion to ancestral characters, the effects of use and disuse, and the direct action of the environment.

From Darwin's perspective, domestication is an extreme and sustained change in a species' conditions of life. The challenge he feels is thus to show that in nature too, albeit on a smaller scale, changed conditions have caused variation. The second chapter takes up this challenge. Here Darwin attempts to show that, while variation is less extensive in nature than on the farm, nevertheless it is more extensive than many naturalists at the time suspected. He attributes the underestimate of variation in nature in part to the fact that taxonomists, devoted to describing the essential features of species, 'are far from pleased at finding variability in important characters' (45). Especially significant, in his view, is that such natural variation is most abundant in groups containing large numbers of species, exposed to the greatest range of conditions of life. Variability persists where it has prevailed in the past. Hence species belonging to larger genera tend to have more varieties than species belonging to smaller genera – a pattern utterly mysterious on the view that species are the products of isolated acts of creation. For Darwin, varieties are but 'incipient species' (52), while species are but 'strongly-marked and well-defined varieties' (55). Furthermore, as Darwin argues later, since 'geology plainly proclaims that each land has undergone great physical changes', organisms in the past must indeed have experienced changed conditions of life,

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521771978 - The Cambridge Companion to Darwin
Edited by Jonathan Hodge and Gregory Radick
Excerpt
More information

and as a result 'varied under nature, in the same way as they generally have varied under the changed conditions of domestication' (468).

In the third chapter, Darwin identifies the struggle for existence as what ensures that inheritable variation in nature accumulates selectively and so adaptively. According to Darwin, citing the precedent of the political economist Thomas Robert Malthus, there is a natural tendency for each species to increase in number geometrically. But there are also many checks on this tendency, such as food scarcity, predation, unfavourable changes in climate, disease and competition with other species. As a result, there is a struggle, more and less metaphorical, to survive and reproduce. Darwin emphasises how dense is the economy of nature, with each species tending to expand to the utmost, at the expense of other species. He compares the 'face of Nature' to 'a yielding surface, with ten thousand sharp wedges packed close together' (67) – that is, each organism and species competes to drive itself as fully as possible into the environment, exploiting resources and so increasing in numbers. Among the intense, complex and interlocking relationships relating organisms to one another and their environmental conditions, it is the organism-to-organism relationships that matter most. Competition between individuals that are most alike will be strongest.

At the beginning of the third chapter, Darwin indicates briefly how inheritable variation and the struggle for existence combine to adapt species to their environments:

> Owing to this struggle for life, any variation, however slight and from whatever cause proceeding, if it be in any degree profitable to an individual of any species, in its infinitely complex relations to other organic beings and to external nature, will tend to the preservation of that individual, and will generally be inherited by its offspring . . . . I have called this principle, by which each slight variation, if useful, is preserved, by the term of Natural Selection, in order to mark its relation to man's power of selection. (61)

Darwin discusses the principle more fully in the fourth chapter, on 'natural selection'. The main contributions of this chapter are twofold. First, Darwin systematically compares artificial with natural selection, arguing for the greater power of the latter to modify species. Over centuries, human breeders have diversified and adapted distinctive breeds of domesticated species. Nature has millions of

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521771978 - The Cambridge Companion to Darwin
Edited by Jonathan Hodge and Gregory Radick
Excerpt
More information

years to work, and is more precise and more comprehensive as a selector, discriminating between the smallest differences.

Second, he relates natural selection to the branching tree of life, via extinction and what he calls the principle of 'divergence of character' (111). For Darwin, extinction is an inevitable consequence of ever better adapted varieties or species arising through natural selection. Since nature is at all times fully inhabited, new kinds of organisms can emerge only by displacing pre-existing ones. And since competitive struggle is often most intense between similar kinds of organisms, an emerging variety or species will often drive to rarity and then extinction those varieties or species nearest to it in structure, constitution and habits. At the same time, the more the descendants of a common ancestral species diverge from one another in these respects, 'by so much will they be better enabled to seize on many and widely diversified places in the polity of nature, and so be enabled to increase in numbers' (112). Darwin goes on to compare the diversification of species in a region to the specialisation of organs in a body. Just as a greater 'physiological division of labour' (115) brings more efficient functioning, so, Darwin argues, a greater diversification of species enables a region to support larger numbers of organisms.

In later editions of the *Origin*, Darwin added a section to this chapter entitled 'On the Degree to which Organisation Tends to Advance'. Here he deals with an apparent difficulty for the claim that natural selection produces progressive change. If the claim is true, why are there still so many unspecialised organisms around? Darwin's answer, in effect, is that natural selection produces greater specialisation other things being equal – and other things are not always equal. To increase specialisation or, in Darwin's terms, advance organisation, natural selection requires both suitable variation and propitious conditions of life. But sometimes more highly organised variants simply do not arise in a particular lineage. Even when they do arise, low organisation is sometimes more adaptive than high organisation.

There is of course more to Darwin's arguments in these chapters. In Kenneth Waters' analysis of the reasoning in the *Origin*, he explores in detail how the analogy between artificial and natural selection works, and how it relates, or does not, to the rest of the book. But even this sketch will suffice to explain why Darwin's theorising

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521771978 - The Cambridge Companion to Darwin
Edited by Jonathan Hodge and Gregory Radick
Excerpt
More information

was controversial and consequential – especially when extended to the case of our own species.

III HISTORICAL REVISIONS

Much entrenched wisdom about Darwin has recently been corrected. Two examples may serve here. First, it now seems certain that, contrary to what many older histories imply, Darwin became a committed and active believer in the 'transmutation of species' – new species arising in descent with modification from earlier ones – only some months after his return from the *Beagle* voyage. Second, again contrary to older and even some newer accounts, Darwin did not arrive at his theory of natural selection in an instant, after reading Malthus' treatise on population in September 1838. Rather, Darwin constructed the theory in several steps spread over many weeks. Nor, it seems, did he reckon it his first truly satisfactory theory of the origin of species, but merely an even more satisfactory version of the theory that he already had.

Historians have been learning to track the subtleties in Darwin's thinking. They have also been learning to think in more critical ways about Darwin's science in its wider context. Old choices no longer appeal – between, for example, insisting that Darwin had debts only to natural-scientific sources in his notebook theorising, and insisting on the contrary that Darwin drew deeply on the writings of the theorist of capitalism Adam Smith. These two views do not exhaust all the possibilities. One could well conclude that Darwin's theorising drew on all kinds of resources within and beyond the natural sciences of the day, including political economy, without accepting that there is compelling evidence for direct debts to readings in Smith.

Large, even ideological, divisions of opinion among historians can be associated with differences in the interpretation of Darwin. The results of specialist scholarship alone do not determine how the accompanying controversies proceed. This volume does not pretend to rise above those controversies or their motivations. On one point, especially, it takes sides. In popular if not in academic representations of Darwin, he is often portrayed as a naïve, innocent, schoolboyish, outdoor, nature-loving traveller and collector, whose theories emerged out of a conjunction of genius, luck and exceptional

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521771978 - The Cambridge Companion to Darwin
Edited by Jonathan Hodge and Gregory Radick
Excerpt
More information

observational opportunity. This Darwin was a naturalist, a man of science, but not a man of ideas, not a man fully joining in the larger collective life of the mind of the age. Darwin himself undoubtedly contributed to this portrayal in many ways; and his immediate family, in their many writings about him, have often perpetuated it. More generally, it fits with a Wordsworthian strain in the English national preference for certain kinds of cultural heroes.

For all their disagreements on other matters, Darwin scholars now concur in emphasising that the older portrayals could hardly be more wide of the mark. Darwin was indeed a man of ideas, a thinker, even at times, yes, a philosopher in our sense and not just in the former sense of a man of science. So – and this is immediately apposite to this volume – there is no paradox to address, no wondering how someone so at odds with our standard notions of a philosopher could nevertheless leave writings behind that have intrigued many philosophers. To lose this paradox is to lose an iconic stereotype of Darwin, long cherished in older scientific and literary circles. It may be appropriate to insist, then, that the stereotype was never a fact about Darwin but rather an interpretation, with no claim to be forever preserved from revision.

Darwinian enthusiasts in science and philosophy sometimes appear defensive and evasive about certain aspects of the larger Darwin story, most obviously the historical connections between Darwin's writings and various political and social doctrines – Nazism is the paradigm, of course – that invoked Darwinism in the name of their absurdities and atrocities. For the purposes of the present volume, it has seemed appropriate to include rather than exclude these connections. What is more, wherever this volume does make exclusions, these should not be taken as signs of denial or dismissal. We regret, for instance, that we were unable to include a discussion of the philosophical tradition – pragmatism – that, in its lineage from Peirce, James and Dewey in the nineteenth century to Quine, Davidson, Putnam, Habermas and Rorty in our own time, has drawn most fully and decisively upon Darwinian science.

Dewey in particular holds an important place not just in the history of philosophical uses of Darwinism, but in the historiography of such uses. He was among the first in a long line of thinkers to argue that Darwinian science challenges one of the central themes in the Western intellectual tradition: essentialism. This comprehensive

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521771978 - The Cambridge Companion to Darwin
Edited by Jonathan Hodge and Gregory Radick
Excerpt
More information

thesis about the historical significance of Darwin goes roughly as follows. From the ancient Hebraic and Hellenic writings to the syntheses of those sources in the Middle Ages and on to the discussions in Darwin's day, the forms – the essences – of natural species, including mineral, plant and animal species, were held to constitute the very order of nature, given to the creation by God. By contrast, the thesis continues, for Darwinian science, plant and animal species are not ultimate constitutive elements of the order of nature, but contingent products of an orderly course of nature. The order in Darwinian nature does not arise from conformity to forms, but from general, causal laws. Furthermore, these very laws entail variation over time and space in all species; and this variation implies – quite inconsistently with the essentialism of Plato or Aristotle, say – that no species, human or plant or animal, has any essential nature. Darwinism, in brief, made essentialism untenable.

The time may have come to question this comprehensive thesis, for several reasons. Most obviously, it presupposes a great deal of uniformity in the pre-Darwinian tradition. Opposing Darwin to Plato and Aristotle risks conflating the two philosophers' very different doctrines; indeed, Aristotle was arguably not at all an essentialist about natural kinds and natural order. Moreover, it may be that Darwinian science does not preclude essentialism about species, nor then about humankind. If Darwinian essentialism is a coherent position, then today's neo-Aristotelian ethical theories or 'virtue ethics', along with many current versions of evolutionary psychology, can uphold the assumptions they seem to require about human nature. There are very large historiographical and philosophical issues at stake here. In this volume, Elliott Sober, Daniel Dennett and Philip Kitcher explicitly endorse much, if not all, of the comprehensive thesis; while Owen Flanagan is apparently one of those for whom human nature lives on after Darwin. We would emphasise our hope that their disagreements will prompt readers to pose new questions about this old issue.

IV FROM PHILOSOPHICAL NATURAL HISTORY TO PHILOSOPHICAL NATURALISM

Darwin thought of himself as a 'philosophical naturalist'; as, that is, a scientific student of natural history – of geology, botany and

© Cambridge University Press www.cambridge.org