

Cambridge University Press

978-0-521-88475-4 - The Cambridge Companion to Darwin, Second Edition

Edited by Jonathan Hodge and Gregory Radick

Excerpt

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JONATHAN HODGE AND GREGORY RADICK

Introduction

I 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, beginning with a chapter on how the young Darwin acquired his distinctive scientific outlook and preoccupations (Phillip Sloan) and concluding with an analysis of the arguments of the most important book of Darwin's maturity, *On the Origin of Species* (Kenneth Waters). In between are chapters reconstructing the extraordinarily wide-

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ranging theorising recorded in the private notebooks that Darwin kept in the late 1830s (Jonathan Hodge), followed by chapters tracking particular elements of that theorising over the whole of Darwin's life: generation, pangenesis and sexual selection (Jim Endersby); and mind, morals and emotions (Robert Richards). The middle chapters of this first part collectively serve, we hope, to correct treatments of Darwin's ideas on sex and mind as late, more or less expendable – and, in the case of pangenesis, regrettable – additions to the main Darwinian corpus. Understanding Darwin's theories as Darwin understood them means taking seriously all that Darwin took seriously, unfamiliar and even uncomfortable as the enterprise might sometimes be.

The second cluster of chapters enlarges focus to examine aspects of Darwin's theorising in relation to his setting, and the reception and influence Darwin had in his own time. This more contextually engaged part of the volume begins with reflections on the old Marxian view that the theory of natural selection is Victorian industrial capitalism naturalised (Gregory Radick). The next two chapters consider Darwin's theorising in relation to two other aspects of his Victorian matrix, its debates about the requirements of sound science (David Hull) and the requirements of sound Christianity (John Brooke). 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 support of their absurdities and atrocities. For the purposes of the present volume, it has seemed appropriate to include rather than exclude these connections, examined here in a chapter on Darwin, social Darwinism and eugenics (Diane Paul). This second part of the volume concludes with a chapter, new to this second edition, which sketches new directions for understanding the place of Darwin's theorising within the *longue durée* of Western intellectual traditions (Jonathan Hodge and Gregory Radick).

Philosophical responses to Darwin now are as much to Darwinian themes in present-day science as to Darwin's own work. Accordingly, the third cluster of chapters, on issues debated among philosophers currently concerned with Darwin's legacy, begins with an overview of changes in evolutionary biology between Darwin's time and ours

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(Jean Gayon). The chapter that follows, on metaphysical and epistemological issues arising within contemporary evolutionary biology (Elliott Sober), in turn sets the stage for a sequence of chapters on how resources from that science are being taken up within particular branches of philosophy. In philosophy of mind, a Darwinian perspective has seemed to help with some problems but not with others – indeed, to have made some problems even more challenging (Kim Sterelny). Similarly mixed views about Darwinism's influence are reported from the research fronts in moral philosophy and social theory (Alex Rosenberg) and philosophy of religion (Michael Ruse). Although these chapters do not hold back from passing judgment on the current philosophical scene, they aim to provide surveys of the state of discussion within the relevant communities.

The chapters in the fourth and final cluster, by contrast, are deliberately, unrestrainedly personal views of where such discussion might be directed. This part of the volume offers examples of philosophers making up their minds 'live' – and not always agreeing with each other – over Darwinian alignments for philosophical enquiries in the future. Daniel Dennett urges a more thoroughly Darwinian interpretation of human creativity, suggesting how recent achievements in artificial intelligence can help us understand even our most impressive mental processes as the mechanical processes they must, for the Dennettian Darwinian, be. Owen Flanagan draws on recent studies in the evolutionary anthropology of emotional expression to sketch a synthesis of opposing 'cognitivist' and 'non-cognitivist' sides in a longstanding debate in metaethics. Simon Blackburn, in a chapter new to this second edition, teases out the multiple affinities between Darwin's thought and that of the great patron of non-cognitivism in moral philosophy, David Hume. And Philip Kitcher closes the volume with reflections on how, in his own thinking across the philosophical board, Darwinian perspectives have enabled insights without, however, providing all the answers.

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

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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 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

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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.

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

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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 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

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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, 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

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

As Darwin's analogical reasonings here have long been controversial, it is worthwhile setting out his understanding of how the relevant comparisons and contrasts worked together. The comparisons made between natural and artificial selection are sometimes relational, sometimes intrinsic. Gloves and socks are relationally alike, gloves having the same relation to hands that socks have to feet. A red brick and a red fruit are intrinsically alike in colour. For Darwin,

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natural selection has the same causal relation to wild species formation as artificial selection has to domestic breed-making. What is more, this proportion alternates, as philosophers say; so natural selection is to artificial selection as wild species formation is to domestic breed making. None of these proportionalities entails or presupposes any intrinsic similarities between the two processes; and so Darwin gives independent reasons for natural selection's being the same kind of causal process as artificial selection. For Darwin, then, natural selection is intrinsically like artificial selection, but very different in degree, because so much more prolonged, exact and all-encompassing in its selective actions. He also gives independent reasons for wild species formation being alike in kind but different in degree from domestic race formation. In accord with these matching contrasts in degree, the greater causal power, natural selection, is capable, he argues, of those proportionally greater effects: wild species formations. A complete account of Darwin's analogical reasonings about selection, natural and artificial, requires, therefore, an appreciation of the comparisons and contrasts he was making between these causes and between these effects: relational and intrinsic comparisons and contrasts, and comparisons and contrasts in kind and in degree.

Second, having made his case for the existence and powers of natural selection, Darwin next relates natural selection to the branching tree of life, via extinction and 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

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

III DARWIN AS THEORIST AND MAN OF IDEAS

Large, even ideological, disagreements have led to differences over the interpretation of Darwin's life and work. And the detailed results of specialist scholarship do not always resolve the resulting controversies. This volume does not rise above these controversies. On one issue, especially, it takes sides. Darwin is often portrayed as a naïve, innocent, school-boyish, outdoor, nature-loving traveller and collector, whose theories emerged from lucky meetings of his genius with exceptional observational opportunities. This Darwin was a naturalist, a man of science, but not a man of ideas, not – to pick a provocative anachronism – an intellectual, a thinker joining in the larger, collective life of the mind of the age. Following Darwin's own lead, his family have often perpetuated this portrayal. It fits well with a Wordsworthian strain in English (but not Scottish) national preferences for certain kinds of cultural heroes; and