

**This Book Review is reproduced by permission of the author and of the Times Literary Supplement in which the Review first appeared on 14 March, 2007.**

## **Evolution myths**

**Jim Endersby**

Morse Peckham, editor

**CHARLES DARWIN'S ORIGIN OF SPECIES**

(Variorum Text)

816pp. University of Pennsylvania Press. \$29.95; distributed in the UK by NBN. £19.50.

978 0 8122 1954 8

Frederick Burkhardt and Duncan Porter, editors

**THE CORRESPONDENCE OF CHARLES DARWIN**

Volume 14: 1866

705pp. 978 0 521 84459 8

Volume 15: 1867

655pp. 978 0 521 85931 8

Cambridge University Press. £75 each

On the morning of November 24, 1859, Charles Darwin's *On the Origin of Species* made its first appearance and the world changed forever. An age of faith was plunged into profound religious doubt, and believers of every kind rose to pronounce anathema on Darwin's godless tract, sparking a fresh battle in the long-running war between science and religion. But while the reactionaries raged, the scientific community soon came to accept natural selection, and the rediscovery of Gregor Mendel's work in 1900 (which marked the founding of modern genetics) set the seal on Darwin's triumph by providing the missing piece to his puzzle – a scientific understanding of just how inheritance works.

Unfortunately, everything in the previous paragraph is nonsense, apart from the *Origin's* publication date (and even that is wrong in Morse Peckham's recently reissued variorum edition, which claims it was November 26). Nonetheless, statements like the ones I've just made summarize the popular view of Darwin and his great book; variations on them are made regularly throughout the media – even by those who really ought to know better. Take, for example, the mythical clash between science and religion. The Victorian “crisis of faith” predated the *Origin* by many years; Tennyson found himself stretching “lame hands of faith” when confronted by “nature red in tooth and claw” in 1850, almost a decade before Darwin went public. When Nature gave voice in Tennyson's *In Memoriam*, instead of demonstrating the existence and beneficence of the creator, she expressed complete indifference for species, the “types” of living things: “‘So careful of the type?’ but no. / From scarped cliff and quarried stone / She cries, ‘A thousand types are gone: / I care for nothing, all shall go’”.

It was the fossilized evidence of extinct species, entombed in the cliffs (until the quarrying,

mining, railway building and canal cutting of the Industrial Revolution revealed them) that led men like Tennyson to doubt that “God was love indeed”. These were doubts that he, and many of his contemporaries, had harboured at least since the 1830s, when Charles Lyell’s geological theories gave them a glimpse of the terrifying vastness of time. An ancient Earth was not inherently disturbing, but the fossil record made it clear that for most of its long history, the Earth had been uninhabited by people. If, as the Bible claimed, this planet had been made as a habitation for humanity, why had its creator taken so long to get the tenants in? And if God was such a great designer, why was almost everything he’d designed now extinct?

Not only did Darwin fail to shatter a universal faith, the Origin’s appearance was actually greeted with enthusiasm by some churchmen. When the Revd Charles Kingsley (of Water Babies fame) wrote to thank Darwin for his complimentary copy of the Origin, he noted that although he’d not yet had time to read it, he had already “gradually learnt to see that it is just as noble a conception of Deity, to believe that he created primal forms capable of self development” as it was “to believe that He required a fresh act of intervention to supply the lacunas which he himself had made”. Natural history was a popular pastime for country clergymen (the ministry, indeed, had been Darwin’s planned career, until the Beagle opportunity came along) and those, like Kingsley, who spent their spare time gathering seaweeds or butterflies, were primed to see the force of Darwin’s arguments. It seemed that Darwin had done for beetles and pigeons what Newton had done for planets; replacing a hands-on deity (who seemed to be forever tinkering with the ill-designed machinery he’d made) with an exalted conception of a divine artificer who had devised natural laws so delicately balanced that they would run forever.

Kingsley was not the only one who found much that was attractive in Darwin’s writing. In December 1866, Mary Boole (wife of the mathematician George Boole) wrote to ask the Origin’s author where he stood on religious matters. (Her letter and his answer, along with meticulous biographical details and explanatory notes from Frederick Burkhardt, are included in Volume Fourteen of The Correspondence of Charles Darwin). She acknowledged that “Science must take her path & Theology hers, and they will meet when & where & how God pleases”, assuring Darwin that he was “in no sense responsible for it, if the meeting-point should be still very far off”. Nevertheless, she inquired delicately after his views, observing that while natural selection might not fit with “any particular scheme of Theological doctrine”, it seemed “quite compatible” with the faith she professed, “that God is a personal and Infinitely good Being”. Boole was an educated woman who took a keen interest in what was then the very new field of child psychology; she told Darwin that far from undermining her belief, “your books afforded me a clue which would guide me in applying that faith” to psychological problems.

Darwin responded politely, modestly claiming that “My opinion is not worth more than that of any other man who has thought on such subjects”, but it “has always appeared to me more satisfactory to look at the immense amount of pain & suffering in this world, as the inevitable result of the natural sequence of events, i.e. general laws, rather than from the direct intervention of God”. Like most Victorian parents, Darwin had watched several of

his children die in infancy, including his beloved daughter Annie in 1851. He was not the only one who found such tragedies easier to comprehend if they resulted from “general laws”, rather than being the products of God’s personal and seemingly murderous intent.

In 1863, when Darwin’s closest friend, the botanist Joseph Hooker, wrote to share the awful news that “I have just buried my darling little girl”, the six-year-old Maria Elizabeth, he confessed that “it will be long before I cease to hear her voice in my ears – or feel her little hand stealing into mine, by the fire side & in the Garden. – wherever I go she is there”. Darwin replied, “I understand well your words: ‘wherever I go, she is there’”. The only consolation he could offer was that “she did not suffer so much . . . This was to us with poor Annie the one great comfort”. Just a few years earlier he had written, in strikingly similar terms, in the *Origin* 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”. The laws of nature might be indifferent to individuals, but in the long run, “from the war of nature, from famine and death”, were able to produce “the most exalted object which we are capable of conceiving, namely, the production of the higher animals”.

Of course, many found the remote consolation of evolutionary progress a poor substitute for a personal and loving God, and many condemned evolution, but the idea that Darwin set science and religion at each other’s throats is simply absurd. Darwin did more than simply avoid offending religious sensibilities, he went out of his way to let his readers assume nature’s laws had a divine origin when, in the book’s second edition, he amended the *Origin*’s final sentence. It originally said: “There is a grandeur in this view of life, with its several powers having been originally breathed into a few forms or into one”, but when the second edition appeared (just a month after the first), the conclusion now read “breathed by the Creator into . . .”. It is plausible to see Darwin as one of those who helped his fellow Victorians resolve their crises of faith, by helping to create a society whose citizens could increasingly hold heterodox religious opinions, free from the fear of accusations of heresy or of being branded an infidel. Public condemnation had still been common a generation earlier, but by 1866 Mary Boole was clearly conscious that enquiring about Darwin’s religious views might be perceived as an invasion of his privacy. In a letter of 1860 to the Harvard naturalist, Asa Gray, Darwin concluded that “I feel most deeply that the whole subject is too profound for the human intellect. A dog might as well speculate on the mind of Newton. – Let each man hope & believe what he can”. The idea that one’s faith was private made an increasingly secular society possible, free from the religious conflicts that had riven Britain in earlier times. Darwin’s friend Thomas Huxley coined the term “agnostic” in 1869 to describe this new concept of an “honest doubter”, someone whose private struggle to hope and believe what he could was no longer any threat to society’s stability.

The Correspondence, together with Morse Peckham’s *Variorum Edition of the Origin* (which was first published in 1959 and has now been reissued by Pennsylvania Press after a long absence), also destroy the myth of Darwin’s instant impact, since they reveal that the *Origin* was still a work in progress long after its first appearance. Darwin produced six editions during his lifetime and, as Peckham

demonstrated nearly fifty years ago, he tinkered constantly with the text, adding and amending, revising and rethinking and, above all, responding to criticism. (Revealingly, Darwin's sentence about consoling ourselves with the thought that death is prompt, while the "happy survive and multiply", appears unchanged in every edition.) When the prestigious science journal *Nature* reviewed the sixth edition of the *Origin* in 1872, the reviewer praised Darwin's "true humility" in acknowledging his mistakes, observing that it had been necessary to reduce the print size in the new edition to make room for the additions. Not only had the book grown, but of the nearly 4,000 sentences in the first edition, Darwin had rewritten 3,000; yet, somewhat surprisingly, most modern editions of the *Origin* use the original 1859 text, thus ignoring the bulk of Darwin's corrections. There has long been a perception that Darwin's "corrections" were mainly mistakes, the argument being that because Darwin lacked a workable theory of inheritance, he responded to criticisms by relying ever more heavily on an outmoded concept that we now know to be wrong, namely Jean-Baptiste Lamarck's "inheritance of acquired characteristics". This was the then widely accepted idea that features acquired during an organism's lifetime could be passed on to its offspring (so that, for example, a blacksmith's children would inherit his enlarged arm muscles). If only, some modern commentators sigh, Darwin had known about Gregor Mendel's famous pea experiments, which were published in 1866: he would have been able to add modern genetics to later editions of the *Origin*, instead of all that Lamarckian nonsense.

Here we stumble on to another Darwin myth. It is often claimed that Darwin owned a copy of Mendel's famous pea paper (*Versuche über Pflanzenhybriden*), but that the pages were never cut. He didn't; Darwin's library has been preserved and no such paper is in it or, as far as anyone has been able to prove, ever was in it. He did own a couple of books that mentioned Mendel, but neither of their authors grasped the significance of Mendel's work and it is clear from the lack of marginal comments in the books that neither did Darwin. He would have been unlikely, too, to grasp the significance of *Versuche*, even if he had been sent a copy.

Despite the enormous historical importance of Mendel's work, it was nineteenth-century plant-breeding, not twentieth-century genetics; a lot of hard work (and a great many fruit flies) would be needed to transform Mendel's insights into modern genetics. As a result, the rediscovery of Mendel's work, far from cementing Darwin's triumph, initially led to his downfall, since many perceived the fledgling science of "Mendelism" to be a satisfactory alternative to the seemingly outdated Darwinian natural selection; in 1903, a German botanist wrote: "We are now standing at the death bed of Darwinism, and making ready to send the friends of the patient a little money to ensure a decent burial of the remains".

The story of how Mendel's and Darwin's respective legacies were transformed to create the modern, synthetic theory of evolution, is a long and complex one. Indeed, the synthesis wasn't completed until the mid-1940s, when naturalists and laboratory biologists finally realized how their different styles of science could be made to work together. One illustration of the gap between Darwin's world and that of modern evolution is the famous Galapagos finches. A long-standing Darwin myth depicts him arriving in the Galapagos, taking one look at these dull little birds, and shrieking "Eureka! Evolution!". In reality, he

not only failed to grasp the significance of the birds, he didn't even realize they were finches; nor did he bother to label his specimens with the crucial information about which island they'd come from. Yet these finches are one of evolution's pin-up organisms; recent studies of "Darwin's finches" have demonstrated natural selection at work under our very eyes, slowly but surely splitting one species into two, each diverging to fill a different ecological niche. How could Darwin have missed that? Mainly because they didn't become Darwin's finches until 1947, when the British ornithologist David Lack published his book of that title; it was the completion of the evolutionary synthesis that allowed scientists like Lack to see how a mathematicized version of genetics could be used to analyse the way natural selection transformed a population. Without a range of modern tools and techniques which he could scarcely have grasped, Darwin would probably not have understood "his" finches, Mendelism or modern evolutionary theory.

The most recent volumes of Darwin's correspondence shed new light on the complex question of the *Origin's* reception and Darwin's responses to his critics; along with Peckham's book, they allow us to see Darwin in his proper historical context. For example, there is no evidence that the *Origin* gets more Lamarckian in succeeding editions: Darwin had been convinced by some aspects of Lamarck's theory from the outset, and he retained this belief, largely unchanged. Neither he nor many of his colleagues saw a conflict between natural selection and some of Lamarck's ideas. The contrast between "good" Darwinism and "bad" Lamarckianism turns out to be yet another myth, largely a product of twentieth-century debates about the relationship between natural selection and genetics.

The story that the books under review tell is a more subtle, complex and ultimately much more interesting one than those invented by the myth-makers. Darwin kept up a dialogue with his various audiences – from clergymen to naturalists – until the end of his life. These conversations were carried on in letters, of course, but also in the published editions of the *Origin*, as Darwin pondered and rewrote, in response to his readers. The letters also tell us so much about Victorian attitudes and society, and serve as a useful reminder that neither Darwin's story nor that of the *Origin* finishes in 1859, demonstrating why the eventual publication of all Darwin's correspondence is going to be so useful. Given how invaluable the Correspondence's footnotes, bibliography, index and appendixes are, it is a shame that the University of Pennsylvania Press did not reset Morse Peckham's book and provide an updated editorial apparatus. The extensive apparatus that accompanies the published correspondence, together with the accompanying website ([www.darwinproject.ac.uk](http://www.darwinproject.ac.uk)), which now includes the text of many of the earlier letters, gives almost as rich an insight into Darwin's readers as it does into the man himself, allowing us to understand how he persuaded and why he sometimes failed; why some found their religious and scientific faiths challenged, while others saw them reaffirmed.

---

Jim Endersby is a historian of science at Cambridge University. He is editing a new edition of the *Origin of Species*. His first books, *A Guinea Pig's History of Biology* and *Imperial Nature: Joseph Dalton Hooker and the practices of Victorian science*, will both be published this year.