

CURRENT SCIENCE

Volume 96 Number 4

25 February 2009

EDITORIAL

Darwin's Champions

In the last two weeks I heard two seminars, in which the speakers projected images of Charles Darwin and quoted from his writings. Since 12 February marked the 200th anniversary of Darwin's birth, tributes to him were not unexpected. What did surprise me was that one of the speakers was an eminent chemist, while the other was a mechanical engineer interested in 'fracture'. Darwin's reach had clearly extended well beyond organismal biology, in the century and a half since he unveiled his theory of evolution in 1859. In an editorial entitled 'Humanity and Evolution' that appears in the February 12 issue of *Nature* (p. 763), attention is drawn to the fact that Darwin and Abraham Lincoln were born on the same day, two centuries ago. The editorial notes that 'these men shared more than just a birthday. . . . They shared a position on one of the great issues of their age: the "peculiar and powerful interest" of their fellow humans bound in slavery. When he circled the world in the 1830s, Darwin's delight at our planet's natural riches was repeatedly poisoned by the cruelties he saw meted out to slaves. "I thank God, I shall never again visit a slave country", he wrote at the end of the *Voyage of the Beagle*' (*Nature*, 2009, 457, 763). The theory of evolution and the principle of natural selection have sometimes been extended to many spheres of human activity, sometimes in a manner that is certainly counter to Darwin's philosophies. Evolution, in the common perception, is most often associated with the inappropriate phrase 'survival of the fittest', whose origins can be traced to the writings of Darwin's contemporary, Alfred Russel Wallace. Totalitarian and repressive political regimes have found this a useful term. Darwin's ideas on biological evolution have always had opponents, although the major debates have long passed. 'Intelligent designers' are a minority group, who have been banished from any serious consideration by mainstream science. Curiously, any attempt to discuss 'intelligent design' is viewed as 'sacrilege' by the scientific establishment, as evidenced by the recent furore at the Royal Society. In a provocative commentary in this journal, Rustom Roy attacks the view of those who 'fearlessly equate the whole future, indeed the very survival of science to the acceptance (whatever that means) of Darwinian evolution as true (whatever that means to them)'. He goes on to add: 'The fact is that even though most

non-biologists (like me) take the general concept of evolution as pretty solid, they never use it. "Evolution" is a tiny corner of, and hardly equal to, "science". It is *never* encountered in the entire world of physics, chemistry and engineering and is hardly used even in most biological research papers' (Roy, R., *Curr. Sci.*, 2009, 96, 340). Roy has undoubtedly overstated his case, but he does draw attention to those who overstate the importance of Darwinian concepts in relation to the large world of science.

How important is the theory of evolution and natural selection in the world outside biology? Mark Pagel provides some interesting facts in an assessment of 'natural selection 150 years on' (*Nature*, 2009, 457, 808). He notes that 'Darwin used the word "evolve" just once in *On the Origin of Species* and even then he waited till the final word of the book. Instead, Darwin wrote of "descent with modification"'. Pagel illustrates the growing usage of the term 'natural selection' in fields that are distant from biology. He uses the term 'natural selection' to search papers listed under separate subject areas in the ISI Web of Knowledge database in November 2008 and produces a subjectwise distribution of the occurrence of the term. The distribution is 'wide and long tailed'. Interestingly there are significantly large occurrences in fields like mathematics, computational biology and computer science. Engineering and chemistry also make an appearance, while the physics literature does not seem to have an appreciable presence of the term 'natural selection'. Darwin's ideas have gained acceptance over the course of more than a century; every challenge countered by formidable champions of the theory of evolution. Beginning with Thomas Henry Huxley, Darwin has had an illustrious line of supporters and interpreters, who have shepherded 'natural selection' through decades of attack by 'creationists' and distortion by ideologues. Even as the Darwin bicentenary was attracting attention, a happy coincidence brought two collections of essays by J. B. S. Haldane (1892–1964) and Stephen Jay Gould (1941–2002) to my table. Both authors have written extensively on biology and evolution, although the collections before me have only a small selection of their writings.

The volume entitled *What I Require from Life* (K. Dronamraju, K. (ed.), Oxford University Press, 2009) puts together 57 short essays by Haldane written largely

in the 1940s and 1950s. In a wide ranging lecture on *Relations between biology and the other sciences*, delivered at the 39th Indian Science Congress in Calcutta in 1953, he quotes from Francis Darwin's reminiscences of his father Charles Darwin: 'I used to like to hear him admire the beauty of a flower; it was a kind of gratitude to the flower itself, and a personal love of its delicate form and colour. I think he sometimes fused together his admiration of the structure of a flower and its intrinsic beauty'. There is also a short piece on *Darwin in Indian perspective* (1958). Haldane reflects on the fact that 'Christian theologians had drawn a sharp distinction between men and other living beings', whereas in 'India and China this distinction has not been made and according to Hindu, Buddhist and Jain ethics, animals have rights and duties'. Indeed, Darwin's ideas have met with great resistance only in the West, particularly in conservative Christian communities. Haldane has an interesting assessment of Darwin. He notes that: 'If Darwin had died young, Wallace would presumably have promulgated the theory of evolution by natural selection when he did, and it would probably have been accepted, though as Wallace's arguments covered a smaller field than Darwin's, the acceptance might have been slower. And as Wallace left loopholes open for supernatural intervention, which Darwin did not, the immediate effect on Western thought might have been less'. Haldane argues that 'Darwin's most original contributions to biology are not the theory of evolution but his great series of books on experimental botany published in the latter part of his life'. In Haldane's view, Darwin's analysis of 'those aspects of plant life which are most like animal and human life' leads to the discovery of facts which are 'momentous'. The applications that have followed include 'the discovery of plant hormones and the invention of weed killers which resemble them chemically, and the systematic outbreeding of maize, of whose importance for the agriculture of the USA I need not write' (p. 212). Haldane points to the last chapter of *Origins* as the starting point for 'a logic based on differences', foreshadowing the application of statistics to population biology and indeed, all other sciences. He concludes his broad assessment: 'Darwin was too great a man to assess just yet. In each succeeding generation new aspects of his work appear important'. Half a century after Haldane, the scholars are still at work on Darwin.

Stephen Gould was arguably one of the finest science writers of the second half of the 20th century. He died prematurely in 2002. An anthology of his writings *The Richness of Life: The Essential Stephen Jay Gould* (McGarr, P. and Rose, S. (eds), Vintage Books, London, 2006), includes several classic essays on evolutionary theory, size, form and shape, sociobiology, racism, reli-

gion and some biographical and autobiographical pieces. In their introduction the editors note that 'as a scientific essayist Gould's only peers were "Darwin's bulldog" Thomas Huxley in the nineteenth century and J. B. S. Haldane in the 1930s and 1940s'. The editors further note that: 'The comparison with Haldane is apt in two further ways. Both made fundamental contributions to evolutionary theory and both were politically engaged within science and in the broader political arena. In Gould's case these more fundamental contributions appeared in their turn in a number of major books, beginning in 1977 with *Ontogeny and Phylogeny* and culminating in his last great work, the 1400-page *Structure of Evolutionary Theory*, published only months before his death. Any one of these major works should have assured Gould an honoured place amongst evolutionary theorists. Yet, unlike Haldane, whose contributions to what became known as "the modern synthesis" of Darwinism with Mendelian genetics, is uncontested, Gould's remains controversial. . . What some saw as his Darwinian revisionism, but he would have regarded as extending evolutionary theory in a direction that the great pluralist Darwin himself would have approved of, earned him obloquy amongst more orthodox ultra-Darwinists. . . . And in some ways Gould's own felicity with words, his hugely popular essays and—to put it positively—self-assurance, won him enemies as well as friends' (p. 2). In this collection of Gould's writings he returns to Darwin many times. He has the remarkable ability to research an obscure fact and turn out a compelling narrative. One example, *The Darwinian Gentleman at Marx's Funeral: Resolving Evolution's Oddest Coupling*, reflects on the presence of an evolutionary biologist, E. Ray Lankester at the Highgate Cemetery on 17 March 1883, when Karl Marx was buried. Gould quotes Friedrich Engels who said, somewhat inappropriately, on that occasion: 'Just as Darwin discovered the law of evolution in organic nature, so Marx discovered the law of evolution in human history' (p. 167). Gould's piece on *The Evolution of Life on the Earth* is a clear statement of a long standing and poorly understood problem in science. He is emphatic that we will not 'complete Darwin's revolution until we find, grasp and accept another way of drawing life's history'. Gould quotes Haldane who 'proclaimed nature "queerer than we can suppose"'. There is a great deal that needs to be understood in the evolution of life and its origins on earth. There is little doubt that a hundred years later, the Darwin tricentenary will provide another opportunity to celebrate advances in evolutionary biology and marvel once again at Darwin's insights.

P. Balaram