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EDITORIAL

Creation, Evolution and Intelligent Design

*Little Lamb who made thee?
Dost thou know who made thee?
Gave thee life and bid thee feed,
By the stream and o'er the mead;*

.....

*When the stars threw down their spears,
And water'd heaven with their tears,
Did he smile his work to see?
Did he who made the lamb make thee?*

—William Blake

There is a grandeur in this view of life, with its several powers having been originally breathed into a few forms or into one: and that while this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been and are being evolved.

—Charles Darwin
The Origin of Species

Natural selection is the blind watchmaker, blind because it does not see ahead, does not plan consequences, has no purpose in view. Yet the living results of natural selection overwhelmingly impress us with the appearance of design by a master watchmaker, impress us with the illusion of design and planning.

—Richard Dawkins
The Blind Watchmaker
Penguin Books, 1990

Descended from the apes! My dear, let us hope that it is not true, but if it is, let us pray that it will not become generally known.

—The wife of the Bishop of Worcester upon hearing of 'Origins', quoted by Patricia G. Horan, Foreword, *The Origin of Species*, Avenel Books, New York (Edition 1979).

No writer has had a greater impact on our view of life and its evolution on this planet than Charles Darwin. His famous synthesis of the observations made during the

voyage of the *Beagle* forms the pillar on which our modern view of biology is supported. Selection and adaptation are words which are now commonly used even by molecular biologists, bringing Darwinism to areas at the very borders of biochemistry and biology. Darwin published his immortal book in 1859 and died in 1882, but his ideas continue to be fiercely discussed even today. In the world of science, Darwin's views are rarely challenged; his ideas as firmly rooted as Newton's are in classical mechanics and in our view of the physical world. But in the larger world, Darwin arouses a fierce response from 'creationists', who hold the view that life forms on earth were created by a divine act. Science and religion appear to come into direct conflict, with the biological view having no need for the intervention of a 'master watchmaker', a benign God manifested in different forms in diverse religions. To open a discussion on science and religion is to tread on dangerous and slippery ground; an area best left to thinkers, philosophers and ideologues. It is in an area that I would normally skirt, (and indeed, I will try to do so here) afraid of being involved in discussions in which I have no expertise. But my interest was sparked by a question posed by a friend, a journalist, who asked: 'Why is it that the creation vs evolution debate rages unabated in the United States, but never seems to be an issue anywhere else in the world, including India?' I was spurred on by an editorial that appeared in the 20 April 2004 issue of *The Hindu*, a newspaper that has always provided space for science. The editorial entitled 'Humankind and Evolution' ended by quoting Clarence Darrow, the flamboyant defence lawyer in the Scopes trial of 1925: 'Ignorance and fanaticism is ever busy and needs feeding'. Within a couple of days of its publication, the *Hindu* editorial drew responses from readers. Of the three published letters, one endorsed the need for 'scientific inputs' at a time when 'obscurantist opinions' seem to prevail. Two others seemed to take a different view. One writer suggested that 'scientific theories are subject to change as new evidence emerges'; an unassailable viewpoint which implied that Darwin and natural selection must still await the jury's verdict. The other correspondent was more emphatic; he took the

view that opponents of Darwin have long favoured, noting that evolution 'involves a degree of creativity and consistency, which points to the hand of a supreme being'. The discussion in the columns of the *Hindu* clearly suggests that natural selection as the driver of biological evolution is a concept that sits uncomfortably in the public perception.

What do children in India learn at school? I found an ISC Biology book aimed at 12th Std students which began a chapter on the 'Origin of Life' with a paragraph on the 'Theory of Special Creation' but quickly moved to a biochemical discussion of molecules, with a prefatory sentence, that 'the idea that life could have originated in the primordial earth in some warm little pond' was advanced by Charles Darwin. The NCERT textbook for Class X in its chapter on 'Heredity and Evolution' resolutely avoids any mention of 'special creation' and votes for Darwinian natural selection and gradual evolution. As opposed to the relative equanimity with which evolution is viewed in the world, Darwinian ideas seem to invite greater challenge in the United States. President George Bush in his election campaign, in 2000, asserted: 'On the issue of evolution the verdict is still out on *how* God created the Earth'. Strangely, this statement seemed to imply that the question of 'who' had been resolved and that the discussion centred on 'how'. Creationists in the US have often challenged the teaching of evolution in schools and demanded equal time for a biblical view of the origin of life. Some years ago the Kansas School Board was embroiled in a controversy; more recently, the Ohio Board of Education has considered the introduction of 'Intelligent Design' to be taught alongside the Darwinian view of evolution.

'Intelligent Design' is a view couched in language that appears borrowed from science; far removed from biblical descriptions of the genesis. Biochemistry seems to enter this challenge to Darwin; its proponents referring to the 'irreducibly complex' systems of the molecular machinery of living cells. One of the champions of intelligent design goes so far as to say: 'Biochemistry . . . describes the workings of many living molecular machines within our cells, but offers very little information about how these systems supposedly evolved by natural selection. . . . Perhaps molecular machines appear to look designed because they are really designed.' (M. J. Behe, *Natural History*, April, 2002). The critics are quick to respond, citing many examples where the components of irreducibly complex systems have 'different but still useful functions'; clear evidence that complexity may evolve by gradual accretion and modification of function (K. R. Miller, *Natural History*, April 2002). Even as the boundaries between the fields of molecular and cell biology, developmental and organismal biology are bridged, new questions on the way evolution has shaped biology will be raised. The gap between chemical and biological evolution is a yawning chasm. The molecular fossil record is

practically non-existent; biochemistry's 'irreducible complexity' manifesting itself in all living organisms. A study that has just been published described a double-stranded DNA viral capsid in a thermophilic archaeal virus. The similarity of the viruses which infect the three domains of life, Eukarya, Bacteria and Archaea, suggests a 'common ancestor that precedes the division into three domains of life > 3 billion years ago' (G. Rice *et al.*, *Proc. Natl. Acad. Sci. USA*, May 2004). The search for fossils of 'ancestral life forms' or for 'primitive molecules', that convincingly demonstrate the blind watchmaker at work, is one of the biggest gaps in 'origins of life research'. Evidence for natural selection, adaptation and speciation abound in Darwin's biological world; the world of biochemistry is not blessed with such a wonderful fossil record. Nearly 20 years ago, A. G. Cairns-Smith wrote a marvellous little book *Seven Clues to the Origin of Life* (Cambridge University Press, 1985; Canto, 1998). The author, an unabashed fan of Sherlock Holmes, suggests that 'the origin of life is a Holmesian problem—that if we can understand how life could have started *at all*, then we should be able to work out, roughly at least, how it *did* start'. Cairns-Smith provides no definitive answers; some of his chapters have dangerously misleading, but seductive titles, cf. 'Build your own *E. coli*'. Nevertheless, his introduction to biology's least understood area remains required reading for anyone, scientist and layman alike, who would like to worry about life's beginnings on earth.

The creation vs evolution debate in the US reached a dramatic climax in the famous 'Scopes Monkey Trial' held in Dayton, Tennessee between 10 and 25 July, 1925. John Scopes, a young school teacher was set up by 'rationalists' to challenge a state law banning the teaching of evolution. The trial could have been scripted in Hollywood; pitting a famous lawyer Clarence Darrow arguing for evolution and a three-time presidential candidate William Jennings Bryan, upholding the creationist view. Darrow demolished Bryan in the trials climax, by putting him on the witness stand.

The battle between creationists and evolutionists continues to be fought in the US, with opponents of Darwinism labelling evolution as a 'secular religion'. In an essay published last year a cautionary note was sounded: 'We who cherish science should be careful to distinguish when we are doing science and when we are extrapolating from it, particularly when we are teaching our students. If it is science that is to be taught, then teach science and nothing more. Leave other discussions for a more appropriate time.' (M. Ruse, *Science*, 2003, **299**, 1523).

In thinking about the origins of life and evolution we would do well to remember a guiding principle in deductive logic enunciated by Sherlock Holmes (*The Adventure of the Beryl Coronet*): 'It is an old maxim of mine that when you have excluded the impossible, whatever remains, however improbable must be the truth.'

P. Balaram

