

## Darwin and Newton: Portraits of similar strokes

I read with interest, the article by S. Chandrasekhar comparing Newton and Michelangelo<sup>1</sup>. Tracing chronologically through the layers of the two supreme creations – of *Principia* by Newton and of frescoes of Sistine Chapel by Michelangelo, he illustrates the signposts left behind by these giants that reflect the astounding similarities in the gradual evolution of their creations. However, while reading the first part of this article where the author lists the events in the life of Newton that are associated with the emergence of the central theme of *Principia*, I could not resist recalling the strikingly similar events in the life of another great creator – Sir Charles Darwin, that are associated with the emergence of the central theme of *Origin of species*.

I am not referring here to the possible similarities in the signposts that might be hidden in the creation of *Origin of Species* by Darwin and that of *Principia* by Newton; in this respect Darwin has already been referred to as 'Newton of Biology' and like Chandrasekhar, J. Huxley has compared these two great creators in his inaugural talk of the Fifteenth International Congress of Zoology at London<sup>2</sup> during July 1958. Rather, what I wish to offer below is a list of events that seem to have surprisingly escaped even the eagle eyes of Huxley family.

1. We are told through the article that 'though the results were promising, Newton did not pursue the subject for another 13 years' and that though his 'first thoughts on gravitation came to him in 1666', the manuscript for the first book was sent to press before 7 June 1686<sup>1</sup>. There appears to be almost 20 years of 'brooding over' by Newton before he finally published it.

When Darwin came back from his famous five year voyage on *HMS Beagle* on 2 October 1836, he apparently had the germ of the theory of natural selection already in his mind<sup>3</sup>. But he was brooding over the idea almost for about 23 years when he finally pub-

lished his great book *Origin of Species* on 24 November 1859.

2. Though Newton had developed the idea as early as 1666 and pursued it in 1679, he was prompted to publish it only after he was persuaded by Halley. In fact when Halley visited him in August 1684, Newton could not find his demonstration among his papers for one of the important aspects of his theory (character of an orbit that a particle would describe in a central inverse square law of attraction), but reworked on it and sent it to Halley.

Darwin also was making notes and had prepared a pencil draft of 35 pages about his theory of evolution, which was only discovered 50 years later in a cupboard at his house in Kent<sup>4</sup>. In fact Darwin also had to be persuaded to write his treatise by Hooker and Lyell. On their persuasion, he reworked on his theory and wrote what he called an enlarged abstract of about 230 pages and sent it to them.

3. Newton's work (*De Motu*) was first reported to the Royal Society by Halley and not by Newton.

Darwin's first report to the Royal Society about his theory of natural selection was by Hooker and Lyell. In fact after Darwin received the mail from Alfred Russell Wallace from Malay Archipelago, he realized that Wallace had outlined in his manuscript, point by point, what Darwin himself had been thinking almost for a decade about the role of selection but had never written to publish. Following this, Hooker and Lyell apparently compiled an article from Darwin's letters and writings and presented it to the Royal Society along with that by Wallace.

4. Newton deduced his basic 'inverse square law' from Kepler's third law that the periods are proportional to the  $3/2$  power of the radii on the assumption of the circular orbits.

Darwin deduced his basic theory of competition and struggle for existence by reading, for amusement, Malthus' *On Population*<sup>4,5</sup>. He writes, 'Here then, I had at last got a theory by which to work'.

There are a number of such other similarities: While Darwin developed his idea during his voyage around the world, Newton developed his ideas 'while he was sojourning in his manor in Woolsthorpe during plague years'<sup>1</sup>. Once persuaded to write, both seem to have completed their voluminous manuscripts within a period of about one year. Newton waited too long because of his uneasiness with his assumption about the concentration of the mass. Darwin hesitated to publish because though he knew that human selection works in shaping the domestic races of crop plants, he was not too sure how selection worked in nature.

One wonders if these similarities are not merely coincidental, but a reflection of the fact that the development of a great idea involves a long course of processing in the mind of its creator who in the meanwhile draws upon inspiration by other giants, continually evaluates his own theory and shows utmost restraint before he is prompted to declare to the world with a strong conviction that his theory is indeed radically different from the common sense thinking. It might be contextual to cite Julian Huxley<sup>2</sup> here: 'Charles Darwin has rightly been described as the "Newton of biology": ... He rendered evolution inescapable as a fact, comprehensive as a process, all encompassing as a concept.'

1. Chandrasekhar, S., *Curr. Sci.*, 1994, 67, 497-499.

2. Huxley, J., *Evolution after Darwin* (ed Sol Tax), University of Chicago Press, Chicago, 1960.

3. Ruth Moore, *Evolution*, Life Time Inc., New York, 1962, pp. 9-38.

4. Huxley, J., *Wonders of the Earth* (ed Ross, N. P.), Life Time Inc., 1960, pp 2-4.

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