



Olaf L. Müller

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The Power of Chance in Scientific Research

Historical Case Study on Colours, Light, Darkness, Newton and Goethe

Our present theory of colours and light is due to a shocking number of coincidences. It originated from Newton's famous prismatic experiments with narrow light rays in the darkness (Newton 1672; 1704). When sent through the prism, the sun's white light is refracted and produces the celebrated Newtonian spectrum (blue/green/red). According to Newton, the light of the sun is split into its multi-coloured components. But this theory – the heterogeneity of white light – gained its plausibility only because Newton chose to neglect equally convincing experiments with the roles of light and darkness switched. In these complementary experiments, Newton's critics sent a narrow shadow through the prism, thus producing an equally beautiful spectrum (yellow/purple/turquoise). Given Newton's logic, the scientists could have equally well proposed another theory, viz., the heterogeneity of darkness.

Indeed some authors formulated such a theory (Lucas 1676, Goethe 1810, Reade 1816). With this they could not succeed – simply because they came too late. Indeed, the history of optics could have taken another course altogether: What if the complementary spectrum had been detected first? What if Newton had been interested in bringing microscopes to perfection rather than telescopes? What if Newton had experimented in the white chamber of an igloo (during the arctic summer in Greenland) rather than in his camera obscura? What if the sun's diameter were five times the size it actually is? What if Newton had not silenced his

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(Foto: S. Schalk)

studied philosophy, mathematics, computer science, and economics in Goettingen (Germany) and Los Angeles (UCLA). He teaches analytic philosophy at Humboldt University (Berlin). In his books he argues against skepticism as derived from Matrix scenarios (2003), in favour of good old metaphysics (2003), in favour of moral observation (2008), and in favour of Goethe's attack on Newton's optics (2015). In his papers, he defends freedom against the neurosciences, pacifism against adherents of just war, and the immaterial human soul against materialism. farbenstreit.de; [Olaf L. Müller](#):

early critic Lucas? Newton had good
luck; a case of serendipity?

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