

Gravity defied?

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The Janus Faces of Genius: The Role of Alchemy in Newton's Thought. By B. J. T. Dobbs. Cambridge University Press: 1992. Pp. 359. £30, \$47.95.

FEW men have had the evolution of their ideas examined so closely and intensively as Isaac Newton. Initially, historians concentrated on the origins of his singular achievements in natural philosophy, gradually basing their studies more and more on the enormous mass of manuscripts devoted to it. More recently, they have dealt with his nonscientific interests — alchemy, Biblical studies, theology — becoming less interested in how he formulated his conclusions than why.

For this, his manuscripts provide an exciting although puzzling source whose range and bulk is extraordinary — Newton was a man who always read and thought with pen in hand, writing and rewriting, taking notes and copying extracts even from books he owned, applying his profound mathematical mind to unravelling a host of obscure texts. Like very many of his contemporaries he believed firmly in the wisdom of the ancients, a wisdom to be understood by patient study. Mysterious, esoteric writings held a great fascination for him, whether the obscurities of the Book of Revelation, the problems of Biblical exegesis, or the deliberately unintelligible language of Hermeticism and alchemy. Possessed of a firmly rational mind, he could never believe that other men would have wasted their lives on chimeras; if they claimed to have discovered universal truth, they must have done so, and he was prepared to struggle all his life to understand the truth that must lie behind the puzzling symbolic language.

But to what end? Dr Dobbs, following the conclusion she tentatively reached in an earlier book in 1975, believes that he sought in alchemy an answer to the major remaining puzzle of his system of natural philosophy, namely the cause of gravity, accepting the alchemists' active vegetative spirit (supposedly responsible for change in both chemical and living matter) as the "hitherto unknown force" at which he hinted in the preface to the *Principia*, a force that might govern "all the phenomena of Nature". Historians have long explored the changing views held by Newton on the cause of gravity, ranging from unknown forces of attraction and repulsion to aethers of varying characteristics. Some scholars have accepted the alchemical interpretation. Many more have concluded that Newton really believed that the ultimate cause of



UNNATURAL history — some mediaeval zoologists were evidently defeated by the elephant, although this much caricatured creature had been known since Roman times. In this pair of pictures from about 1230, showing one in use in war and a group attending a fallen friend, the unfortunate beasts seem rather to resemble pigs. The invented scenes are reproduced in *Images of Science: A History of Scientific Illustration* by Brian J. Ford. Published by Oxford University Press (US) and The British Library (UK), \$45, £25.

gravity was the immanent will of God, as he said at the very end of the *Principia*. Now Dobbs agrees with this view. Although the first half of *The Janus Faces of Genius* is concerned with Newton's study of alchemy, the second and longer part deals with his varied studies in ancient philosophy (Pythagorean, Epicurean, neo-Platonist, Hermetic and Biblical) and his theological studies (especially his conversion to Arianism). The relevance of his Arianism apparently lies in the Arian belief that Christ, while divine, is the mediator between God and the material Universe, including man; for God, being non-material, does not act directly on matter (a view that undoubtedly subsumes other heresies besides Arianism).

In the modern way, Dobbs explores minutely the various strands of thought which, she finds, led Newton to his conclusions. She rightly points to the fact that Newton always sought rational not mystical truth, albeit often transcendental truth. She will not be surprised that I find the second half of her study more convincing than the first; I do not accept her belief that Newton was a "practising alchemist", not least because this belief rests partly on dubiously Newtonian texts that are most probably summaries

of the work of others. That Newton believed he understood the alchemical texts he studied so assiduously is obvious, if only from his use of alchemical names for (real) chemical substances in the chemical notebooks, so clearly experimental. Nor does it seem to me surprising that Newton should have endeavoured over so many years to solve such intellectual puzzles as the meaning of alchemical, Hermetic and Biblical texts: he was after all the most brilliant mathematician of his age and most mathematicians are inveterate puzzle solvers, who need to occupy their puzzle-solving facility when not involved in mathematical invention. Whether Newton would have agreed with Dobbs's analysis of how and why he arrived at his conclusions about universal gravitation and other physical forces is a question beyond solution. This is a complex and detailed work of scholarship, whose author has left no clue unexamined. Whether her proof is satisfactory must be left to the reader. □

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