

The Penultimate Curiosity: How Science Swims in the Slipstream of Ultimate Questions

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Religion and science are commonly portrayed as mortal enemies. A new book, praised by scientists and theologians alike, suggests a far more interesting relationship

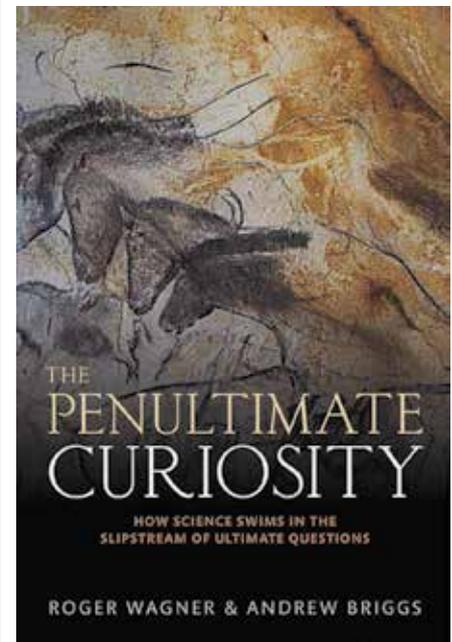
Above the doorway to the Cavendish Laboratories in Cambridge, beneath a pointed arch filled with gothic tracery, a passage is carved in stone: 'Magna opera Domini exquisita in omnes voluntates ejus'. This text, the Vulgate rendition of Psalm 111.2, was chiselled there in 1874 at the request of the first Cavendish professor, the brilliant physicist and ardent Christian, James Clerk Maxwell. A century later, when Latin was no longer an entrance requirement for Cambridge physicists, 'a devout research student' suggested that the same passage be re-inscribed in English above the far more utilitarian new doorway to the new Cavendish labs recently constructed in west Cambridge. Maxwell's successor, the Cavendish professor Sir Brian Pippard, 'put the proposal to the Policy Committee, confident that they would veto it'; but to his surprise 'they heartily agreed both to the idea and to the choice of Coverdale's translation' from the original Hebrew, familiar from the *Book of Common*

Prayer. So today, as one crosses the threshold of this sancta sanctorum of British science, one is reminded that 'The works of the Lord are great, sought out of all them that have pleasure therein'.

The 'devout research student' in question was Andrew Briggs, now Oxford's Professor of Nanomaterials and Fellow of St Anne's. *The Penultimate Curiosity* – a book which he has co-written with the leading religious artist Roger Wagner – can be regarded as a 450-page attempt to explain the paradox of the Cavendish doorways.

I say 'paradox' because modernity is so often defined in terms of secularization, and religion so often conceived as the archenemy of science. The pedigree of these ideas goes back centuries, to the Enlightenment's secularization of Protestant claims that history progresses by freeing the mind from mediaeval dogma and superstition. But they were only given wide currency in the English-speaking world with the five dozen reprints of John Draper's *History of the Conflict between Religion and Science* (1875) and Andrew Dickson White's more substantial *History of the Warfare between Science and Theology* (1896). It is thanks to a long series of works descending

from these – and continued most recently by Richard Dawkin's best-selling *The God Delusion* of 2006 – that it seems paradoxical to find glowing testimonials on the dust jacket of *The Penultimate Curiosity* from the Astronomer Royal and the Director General of CERN alongside the former Chief Rabbi and the current Archbishop of Canterbury.



The Penultimate Curiosity

A less ambitious book might be content merely to demonstrate that the normal relationship between western science and religion has not in fact been one of perpetual war. A slightly more broadminded book might have argued that this relationship is fully symbiotic, with each transforming the other to the benefit of both. From St John's Gospel onward, Jerusalem was as thoroughly reshaped by Athens as Athens by Jerusalem. That dialogue, to be sure, has been punctuated by episodes of dispute and disagreement; but the same holds for the discussions within the individual domains of science and theology. *The Penultimate Curiosity* does not give equal treatment to the transformation of theology by science, and this imbalance sometimes gives the book the air of religious apologetic. Instead, it is devoted primarily to exploring the more interesting side of this relationship: the sense in which the 'penultimate questions' pursued by science 'swim in the slipstream of ultimate questions' associated with theology.

What precisely is meant by this evocative metaphor? This book leaves its reader free to distil an answer from huge quantities of fascinating historical anecdote loosely knit together by sparse passages of crisp analysis. So perhaps the title is best expounded by illustrating the book's thesis at its most impressively robust.

The immense effort to understand the

world we call modern science is predicated on the assumption that the world is ultimately intelligible because it is governed by universal, mathematical laws. But what is the basis of that assumption? Viewed philosophically, the answer is not obvious. According to Karl Popper, this assumption rests on 'a faith which is completely unwarranted from the point of view of science, and which to that extent is metaphysical' (p. 434). Max Planck is quoted to similar effect in a passage uncannily reminiscent of the Cavendish laboratories: 'Over the entrance to the gate of the temple of science are written the words "ye must have faith".'

Yet if the philosophical basis of this assumption is difficult to substantiate, its historical origin is more readily traced: to the domain of theology. Throughout the centuries-long gestation of modern science, the intelligibility of the natural world was guaranteed by belief in a single, beneficent rational agency who created that world and endowed it with universal laws governing the smallest particle as well as the longest process. Our capacity to grasp those laws was guaranteed in turn by the doctrine that we were made in the image and likeness of that agency, with enough of its rationality to perceive the marks of the Creator on the creation. Empirical study of the natural world was therefore a means of revealing the wisdom of the Creator, and could be regarded as both a right and a duty. Since the world was created for mankind,

obtaining intellectual and practical dominion over nature was also part of the divine plan. The poetic statement that science swims in the slipstream of theology can be rephrased historically as the claim that biblical monotheism tinged with Greek metaphysics provided a series of interconnected premises invaluable (if not strictly necessary) to the genesis of modern science.

This is not to say that these premises were either revealed on Mount Sinai or discovered in the sacred groves of Athena. On the contrary, they evolved, very gradually, over at least two millennia in Europe and the Near East from a process in which the heritage of Greek natural philosophy and mathematics was reshaped by dialogue with the deepest principles of Judeo-Christian-Islamic monotheism and vice versa. Most of the book traces stages in this historical process from Athens via Alexandria and the Muslim world to the mediaeval universities and onward throughout the seventeenth century as far as Newton and the first Newtonians.

For the authors, discovering these stages was clearly a process of personal discovery, and this story is related as a series of excavations by gentlemen virtuosi straying far from their specialist fields. This is a slightly dangerous technique, since it can easily arouse suspicions of amateurism and tendentiousness; but that impression is misleading. In fact, Wagner and Briggs are themselves swimming in the slipstream

of a huge amount of patient scholarly work undertaken at an exponentially accelerating rate as the history of science gradually emerged as a specialist discipline over the course of the past century.

If the maturity of any field is demonstrated by its capacity to revise its foundational assumptions, the history of science in the past generation has passed this test. Amongst the assumptions most thoroughly overturned by a century of scholarship is Draper and White's thesis about the perpetual warfare between science and religion. That Hellenistic cosmology, early Islamic mathematics, or the scholasticism of the high Middle Ages drew much of their energy from theology is perhaps not surprising. That the same holds for many of the architects of the 'scientific revolution' – Bacon and Kepler, Leibniz and Newton, and even such arch-heretics as Spinoza – has been a more recent and surprising discovery. With the secularization of Newton's legacy in the Enlightenment, to be sure, this trail cools. More could certainly be done to argue that modern science continued to 'swim in the slipstream of ultimate questions' in many currents of the Enlightenment, in German Idealism, and in the mind of Einstein as well as Maxwell, for instance. But within the pages of *The Penultimate Curiosity*, the contemporary application of this thesis remains an open question.

Yet the biblical motto above the doors to

the Cavendish laboratory has other slightly different but no less powerful contemporary resonances as well. 'The works of the Lord are great, sought out of all them that have pleasure therein.' Why might these words resonate with scientists not consciously moved by 'ultimate curiosity'? Do scientists today recognize themselves in this ancient description of 'all them that have pleasure' in unravelling the secrets of nature? Do they like to be reminded that the pure delight in discovery has helped sustain the western intellectual tradition since the dawn of recorded history? Do they agree that this pursuit of natural knowledge can legitimately be described as sacred both because it constitutes one of the most magnificent activities human beings are capable of and because it endows our species with so much of the value we possess? Do they perhaps even draw the conclusion that modern science is better served by these perennial values than by the short-sighted utilitarianism of our own day?

One task of intellectuals is to critique the dominant ideology of the age, and the overbearing orthodoxy of our own era is not the theology of any universal church but the secular dogma of neoliberal economics propagated in the interests of global capitalism. Like the Psalmist, Aristotelian metaphysics began from the principle that all human beings by nature desire to know. Neoliberal economics begins from the principle that all men by nature desire to maximize profit while minimizing effort.

Which of these two principles more nearly captures the motivation of the Astronomer Royal, the Director General of CERN, Oxford's Professor of Nanomaterials, or his artistic collaborator? Which best sustains a culture adapted to raising ultimate as well as penultimate and antepenultimate questions?

For the time being, it seems, modern science still swims in the slipstream of ancient values and aspirations. But how long can it continue to swim against the current of the alien orthodoxy of our own age? The crass materialism of contemporary 'modernizers' may yet lead scientists to rediscover their ancient roots. Not the least significance of *The Penultimate Curiosity* is its contribution to a debate which is acutely political as well as deeply theological.

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