

# Science and Christianity

*This essay is the revised version of a talk I gave at St Andrew's Cathedral in 2012.*

In recent years, a group of writers has emerged onto the literary scene with a number of books vehemently criticising religion. These books have topped the best-seller charts and have provoked robust but mixed responses from all quarters. Described as the 'New Atheists' these writers – Richard Dawkins, Sam Harris, Daniel Dennett and Christopher Hitchens – are the new crusaders of scientism determined to undermine religion in general, and Christianity in particular. The titles of their books clearly reveal their project: *The End of Faith* by Sam Harris, *The God Delusion* by Richard Dawkins, *Breaking the Spell* by Daniel Dennett and *God is not Great: How Religion Poisons Everything* by the late Christopher Hitchens.<sup>1</sup> These writers, some of whom are scientists, insist that science is the sole basis of reliable truth because it is based on hard evidence and rigorous reasoning. This view presupposes that faith and reason are at odds with one another, and that reason alone, not faith, is the basis of truth. This view also presupposes that the scientific endeavour does not require the commitment of faith at all.

The New Atheists are in fact reviving the old and almost defunct 'conflict' or 'warfare' thesis promoted by two influential books that appeared in the nineteenth century: J. W. Draper's *History of Conflict between Religion and Science* and A. D. White's *A History of Warfare of Science with Theology in Christendom*. Most historians of science now regard this once popular view that science and religion are in permanent and irresolvable conflict as unacceptable. Writers like Dawkins and Dennett, however, seem adamant to revive this view in order assert that faith is delusional and religion dangerous. Dawkins has gone so far as to compare scientists who promote a positive relationship between science and religion to the British Prime Minister Neville Chamberlain's attempt to appease Adolf Hitler,<sup>2</sup> despite the obvious ridiculousness of such a comparison. Through their peculiar version of Darwinism, both Dennett and Dawkins argue that religion is an 'accidental by-product' or a 'misfiring of something useful'.<sup>3</sup> By promoting a version of scientism or naturalism, Dawkins and Dennett reject all religious faith as superstition. As the sole basis of truth, then, science is the enemy of faith.

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<sup>1</sup> Sam Harris, *The End of Faith: Religion, Terror, and the Future of Religion* (New York: W.W. Norton, 2004); Richard Dawkins, *The God Delusion* (Boston: Houghton Mifflin, 2006), Daniel Dennett, *Breaking the Spell: Religion as a Natural Phenomenon* (New York: Viking, 2006), and Christopher Hitchens, *God is Not Great: How Religion Poisons Everything* (New York: Twelve, 2007).

<sup>2</sup> Dawkins, *God Delusion*, 66-69.

<sup>3</sup> Dawkins, *God Delusion*, 188.

How are we to understand the relationship between science and religion, especially Christianity? The answer to this question is complex, and can be approached from different angles and perspectives. In the compass of this brief lecture, I have elected to answer this question from the standpoints of history and philosophy. Firstly, we will examine the historical relationship between Christianity and the development of the natural sciences. Next, we explore the reasons for the secularisation of science and the scientific outlook, which gave rise to naturalism or scientific materialism. Then, we will analyse the claims of scientism or naturalism and expose their profound weaknesses. And finally, we will try to imagine what a dialogical relationship between science and Christianity might look like.

## **Religion and the Development of the Natural Sciences**

The conflict or warfare model that presents Christianity and science as forever at odds with one another is at best a selective reading of the history of science that must be challenged. As John Hedley Brooke perceptively points out in his important book, *Science and Religion*, 'The fundamental weakness of the conflict thesis is its tendency to portray science and religion as hypostatized forces, as entities in themselves. They should rather be seen as complex social activities involving different expressions of human concern, the same individuals often participating in both'.<sup>4</sup> As we begin our reflection on the role of religion in the development of the modern natural sciences in the West with the intellectual and cultural ethos of the Middle Ages, we will immediately see the intricate and complex relationship between the two recounted by historians of science like Brooke.

We begin in the medieval West, and with the observation that scholastic theology has always emphasised the importance of both reason and revelation in the knowledge of God and the world. The Schoolmen of the Middle Ages maintain that God can be known through the faculty of reason and by observation of the empirical world, without the aid of revelation. For example, in his famous cosmological argument for the existence of God, the great medieval theologian Thomas Aquinas maintained that in reflecting on the reality of the world, it is possible by the principle of cause and effect, to conclude that God is the Creator or Cause of the world. It is possible to perceive God as the Uncaused Cause that brought everything into being. However, truths concerning the triune being of God, the work of Christ and the future of the creation can only be known through special revelation that God has made available through his dealings with Israel and in the incarnation of the Son. According to scholastic theology, therefore, the two sources of knowledge – reason and revelation – are not at odds with one another. Rather they compliment each other. Put differently, for the medieval theologians, reason and revelation are consistent with one another.

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<sup>4</sup> John Hedley Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge: Cambridge University Press, 1991), 42.

Furthermore, medieval theology maintains that the world is real. That is, the world is a concrete extra-mental object that can be perceived, experienced, studied and understood. In addition, the human mind has the capacity to grasp the structures of this created reality and to penetrate its stratified order to reach its true essence. Thus, it is not only the structures of the world that is intelligible; its basic workings and processes can also be comprehended by the human mind. Yet, the world continues to hold its mysteries because it is the handiwork of the inscrutable God. And God continues to be active in the creation, sustaining it and causing it to flourish by his generous provisions. The Uncaused Cause of Thomas Aquinas is of course in fact the personal God of the Bible, who continues to lovingly care for the world that he has created. The human being is the crown of God's creation. As beings created in the image and likeness of God, they are tasked to be stewards of the creation. Ian Barbour summarises the whole medieval outlook that urges a profound synthesis between reason and revelation, science and theology thus:

This was the total plan, the coherent pattern into which all things fitted and from which they derived their significance. It was a unified hierarchical order in which every being plays its part. All nature serves humanity, and humanity serves God. The social order, too, was fixed and hierarchical. Science, cosmology, society, history, theology all expressed the same pattern of meaning.<sup>5</sup>

Besides the scholastic synthesis of reason and revelation that has done so much to prepare the ground for the natural sciences, the metaphor of God's 'two books' of revelation – the books of scripture and nature – also has a long pedigree in Western intellectual history. This idea is evident in the writings of early Christian writers like Justin Martyr and Irenaeus of Lyons in the second century. In *Against Heresies* Irenaeus taught that God can be known through his word as well as through his works: 'One God formed all things in the world, by means of the Word and the Holy Spirit; and although he is to us in this life invisible and incomprehensible, nevertheless he is not unknown; inasmuch as his works do declare him, and his Word has shown that in many modes he may be seen and known'.<sup>6</sup> But it was John Chrysostom, the eloquent Antiochene preacher of the fourth century who clearly spelt out the importance of the book of nature: 'Upon this volume, the unlearned, as well as the wise man, shall be able to look, and wherever anyone may chance to come, there looking upwards towards the heavens, he will receive a sufficient lesson from the view of them ...'<sup>7</sup> During the period of the Reformation in the 16<sup>th</sup> century, the idea of the two books is kept alive by some of its most eminent theologians. John Calvin speaks of nature or the created order as the theatre of God's glory in his celebrated *Institutes of the Christian Religion*.

The emphasis on God's second book – the book of nature – has contributed to the rise of the natural science in the scientific revolution that took place in the

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<sup>5</sup> Ian Barbour, *Religion and Science: Historical and Contemporary Issues* (San Francisco: Harper Collins Publishers, 1990), 9.

<sup>6</sup> Irenaeus, *Against Heresies*, Book V, Chapter 20.

<sup>7</sup> Chrysostom, Homily IX.5, 162-3.

seventeenth century. The great Italian physicist and astronomer Galileo Galilei appealed to the mysteries of the book of nature that invite careful investigation and study in his famous defence of astronomy in his *Letter to the Grand Duchess Christina*. Galileo writes: ‘... to prohibit the whole science [of astronomy] would be but to censure a hundred passages of holy Scripture which teach us that the glory and greatness of Almighty God are marvellously discerned in all his works and divinely read in the book of heaven’. So profound and deep are nature’s mysteries that even the keenest minds are not able to fully unravel them: ‘Within its pages are couched mysteries so profound and concepts so sublime that the vigils, labours and studies of hundreds upon hundreds of the most acute minds have still not pierced them, even after continual investigations for thousands of years’.<sup>8</sup> Even Francis Bacon, who wanted to keep the two books quite discreetly apart from each other, admitted that the book of nature is capable of drawing the thoughtful scientist ‘into a due meditation of the omnipotency of God’.<sup>9</sup> Until its decline in the eighteenth century – a decline occasioned by the rise of deism and secularism – the metaphor of the two books of God provides a helpful bridge that connects science and religion, two complex spheres of human experience, and shows how they may be properly related.

Although the rise of science in the West is a complex phenomenon brought about by numerous social, intellectual, political and historical factors, we should never underestimate the contributions made by Christianity. In fact, it would not be an exaggeration to say that it was Christianity and its distinctive worldview that made it possible for the natural sciences to develop and flourish in the West. The most important ideas that Christianity has contributed in aiding the scientific enterprise are connected with its doctrine of creation. Christianity teaches that the material world came into being because God had created it out of nothing (*ex nihilo*) in accordance to his sovereign will. The doctrine of creation de-divinises the material world and nature by insisting that they are not gods, but are created entities whose existence is dependent on the Creator. By debunking all attempts to deify the material world, the doctrine of creation teaches that nature is not to be worshipped or feared. It is the handiwork of a loving but sovereign Creator that can be studied.

The understanding of the material world as creation has a number of important implications to our view of nature.<sup>10</sup> Firstly, it points to the fact that nature is intelligible, open to empirical and rational investigation. The idea that the material world is the handwork of God also led to the view that the created order, although contingent, is orderly and consistent. This, together with the confidence in the rationality of human beings created in the image of God, has encouraged the scientific study of the material world. Secondly, the doctrine of creation implies that the world as we experience it was created by God’s free act. This means that the world as we experience it need not be as it is: God could have created a very different world. Thus, the only way in which we can know

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<sup>8</sup> Galileo, *Letter to the Grand Duchess Christina*, 1615. Quoted in Peter M. J. Hess, ‘God’s Two Books: Special Revelation and Natural Sciences in the Christian West’, in Ted Peters and Gaymon Bennett, *Bridging Science and Religion* (Minneapolis: Fortress Press, 2003), 132.

<sup>9</sup> Francis Bacon, *The Advancement of Learning* quoted in Hess, *God’s Two Books*, 132.

<sup>10</sup> Barbour, *Religion and Science*, 28.

and understand this world is to observe and study it. Put differently, it is precisely because the world is contingent, the product of God's free will, that we can know it only through empirical study. Finally, the Christian doctrine of creation fosters a certain attitude towards nature. In Genesis 1, after God had completed his work of creation on the sixth day, we read: 'God saw all that he had made and it was very good' (Gen 1:31). The created order was 'good', 'very good'. This means God has created the world for a purpose. This further implies that we must always approach nature with respect even as we investigate its mysteries. But because God is the meaning of the world the ability of science to explain it is limited, despite its phenomenal advances. While science is able to investigate the workings of nature, on its own it is unable to unravel its meaning. In other words, science is unable to answer the ancient question: 'Why is there something and not nothing?' Be that as it may, the basic point here is that Christianity has contributed profoundly to the justification and development of the natural sciences in the West.

## Science and Secularism

The rationalism of the seventeenth century gave birth in the eighteenth to one of the most important developments in Europe's intellectual and cultural history, namely, the Enlightenment. Aply described as the 'Age of Reason', the philosophers of the Enlightenment underscored the omniscience of reason as the arbiter of truth and morality in a way that far surpassed the rationalism of their predecessors like Rene Descartes. Although not all the philosophers of the period were atheists, those who embraced secularism and naturalism have sought to set the natural sciences free from the fetters of religion and superstition. For example, the celebrated philosopher and encyclopaedist of the French Enlightenment Baron d'Holbach saw religion as an obstacle to the progress of science and the true understanding of nature. In one fell swoop, d'Holbach denied the existence of God, freedom, and immortality in the name of an extreme materialism or naturalism. He advocated nature-worship instead and even wrote odes to the natural order that are reminiscent of the hymns of traditional Christianity: 'O Nature! Sovereign of all beings! And you, her adorable daughters, virtue, reason and truth! Be ever our only Divinities'.<sup>11</sup>

The rationalists of the Enlightenment embraced an optimistic view of human nature, and saw reason, not religion, as the basis for the progress of society. Thinkers like the Genevan philosopher Jean-Jacques Rousseau maintained that human beings are essentially born virtuous, but are corrupted by ignorance and the negative influences of social institutions. The solution to the ills of society therefore, according to Rousseau, is not religion but education and the advancement of reason. The rationalists therefore spoke of the perfectibility of human nature through education that would usher in a this-worldly utopia, a secular 'eschatology', with the establishment of the 'heavenly city' on earth. But confidence in the power of reason is not confined only to philosophy and the

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<sup>11</sup> Baron d'Holbach, *Systeme de la Nature*, quoted in Franklin Baumer, *Religion and the Rise of Scepticism* (New York: Harcourt, Brace, 1960), 64.

natural sciences. Its influence is felt in all human affairs including politics and economics. Furthermore, the rationalists have refashioned their understanding of nature such that it is now regarded as an ally to reason and an aid to human progress, not an impediment. As Ian Barbour has pointed out, in the vision of the rationalists, 'Nature (usually capitalised) was considered an ally of human progress; we can feel at home in an orderly and harmonious world'.<sup>12</sup>

The most influential philosopher of the Enlightenment is arguably Immanuel Kant. Unlike Rousseau and d'Holbach, Kant did not reject religion *in toto*, although he had very little patience for the established religion of his day and its antiquated doctrines. Kant reduced religion to a form of morality premised on a vague theism. What is of interest here is Kant's view of the relationship between religion and science. While the Enlightenment philosopher affirmed the validity of both, he wanted to keep them distinctly apart. He saw religion and science as having their own specific realms and functions. Science has to do with the analysis of the natural phenomena, while religion is concerned only with the moral life. For Kant, the book of Scripture is about morality and not much more, and the book of nature says nothing about God. E. A. Burtt offers a succinct summary of Kant's view of the relationship between religion and science:

For Kant, science and religion occupy entirely different spheres and are given distinct functions which are so adjusted that they need never conflict. The realm of possible knowledge belongs to science, and science has complete freedom to explore that realm by its own method. The task of religion is to enlighten our moral devotion and give it cosmic serenity.<sup>13</sup>

It was Pierre Laplace (1749-1827) who in commandeering Newtonian mechanics developed a secular and materialistic view of reality. Although Newton would allow that God sometimes intervenes in the world he has created, despite the natural laws that he has put in place, Laplace insisted that such interventions are not necessary. He therefore postulated the view of the world that is governed solely by exact and absolute physical laws. There is no need to appeal to God to explain the gaps in the scientific account because further investigations would surely give scientists a more complete understanding of these laws. This account of reality, however, is both deterministic and reductionistic. It is deterministic because if reality is in fact nothing more than matter in motion, and if the laws that govern the motion of objects can in theory be fully understood, it would be possible to predict the movement of every particle. This means that all future events are determined. This approach is reductionistic because it claims that the physical laws could provide an explanation for all of reality. God, even as a hypothesis, is no longer needed. Thus, when Napoleon asked Laplace why he never mentioned God in his book on the system of the universe, he famously replied: 'I had no need of that

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<sup>12</sup> Ian Barbour, *Religion and Science: Historical and Cotemporary Issues* (San Francisco: Harper, 1997), 38.

<sup>13</sup> E. A. Burtt, *Types of Religious Philosophy* (New York: Harper and Brothers, 1951), 206.

hypothesis'.<sup>14</sup> Under the influence of scientists like Laplace, the secularisation of science was afoot. Theological ideas are no longer either deemed appropriate in scientific discourse nor necessary for investigating and understanding the world.

The triumph of science and the rising sceptre of atheism in the West in the 18<sup>th</sup> century were often accompanied by a steady assault on established religion. Newton's theory of gravitation that provided an explanation for planetary motions convinced many of the competence of science and the power of reason. As John Brooke has pointed out: 'Science was respected not simply for its results, but as a way of thinking. It offered the prospect of enlightenment through the correction of past error, and especially through its power to override superstition'.<sup>15</sup> The rise of scientific knowledge is also accompanied by the growing scepticism of other forms of knowledge, especially religious knowledge. Since scientific theories are derived from empirical study of the world based on sense experience, claims for knowledge based on divine revelation or illumination are subjected to scepticism and finally dismissed as ill-founded. Furthermore, science challenged some views about the world and humanity that were long held and cherished by the Church. For example, the view that human beings have been in existence since the world came into being was no longer tenable in the 18<sup>th</sup> century because of the discoveries of science. There therefore took place in the 18<sup>th</sup> century a seismic change in attitude and mindset towards religion vis-à-vis the natural sciences. Brooke writes:

Such shifting sensibilities are not easily explained, but they were often proclaimed by writers who saw in the sciences a vehicle of social and intellectual liberation. The polarity between 'reason' and 'superstition' was a recurring motif in the rhetoric of the Enlightenment, reinforced by claims for a rigorous methodology in the sciences that religious inquiry could not match.<sup>16</sup>

In the 19<sup>th</sup> century, Charles Darwin's theory of evolution presented a further challenge in the minds of many to the claims of religion. Darwin did for biology in the 19<sup>th</sup> century what Newton had done for physics in the 18<sup>th</sup>. With the publication of his celebrated *Origin of Species* in 1859, Darwin presented a theory of biological development that left little room for divine agency and intervention.<sup>17</sup> Although the details of his theory need not detain us here, it would be useful to rehearse some of its salient features. Darwin found evidence of the occurrence and inheritability of small variations among members of different species. He argued that these variations were able to confer slight advantages to these species in their struggle for survival. From these premises, Darwin developed his theory of evolution according to which the fittest species survive through the process of natural selection. Although Darwin himself was cautious in his criticism of religion, some of his followers went on the offensive

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<sup>14</sup> Roger Hahn, 'Laplace and the Mechanistic Universe', in *God and Nature*, ed. David Lindberg and Ronald Numbers (Berkeley and Los Angeles: University of California Press, 1986), 45.

<sup>15</sup> Brooke, *Science and Religion*, 153.

<sup>16</sup> Brooke, *Science and Religion*, 155.

<sup>17</sup> Morse Peckham (Ed), *The Origin of Species by Charles Darwin: A Variorum Text* (Philadelphia: University of Pennsylvania Press, 1959).

against Christianity. For them, the theory of evolution has successfully debunked not only the literalist reading of the Bible, but also the belief in God. This in turn provoked a fierce reaction from the conservative theologians for whom the literal understanding of Genesis 1 is non-negotiable. Moderate voices are also heard in response to Darwin's theory: Genesis 1 is read as a poetic description of the creation of the world that does not require a literalist interpretation. According to these theologians, the main theological insight in the first chapter of the Bible has to do with the world's dependence on God.

Darwinian evolution has also call to question human uniqueness, a view long held in the Western intellectual tradition. Darwin's theory seems to have minimised the difference between humans and the animals. Darwin even claimed that the human capacity for moral judgement is the result of evolution in general, and natural selection in particular. Thus, in overemphasising the continuity of humans and animals, Darwin and his followers have introduced a kind of reductive biologism, where every facet of the human phenomenon can be explained in essentially biological terms. Not all biologists in Darwin's day agreed with his radical ideas. For example, although Thomas Huxley had much admiration for Darwin, and had publicly supported and promoted his work, he nevertheless argued persuasively that human morality could not possibly be a product of evolution. In his 1896 book, *Evolution and Ethics* Huxley writes:

The practice of that which is ethically best – what we call goodness or virtue – involves a course of conduct which in all respects is opposed to that which leads to success in the cosmic struggle for existence. In place of ruthless self-assertion, it demands self-restraint; in place of thrusting aside or treading down all competitors, it requires that the individual shall not merely respect, but shall help his fellows; its influence is directed, not so much to the survival of the fittest, as to the fitting of as many as possible to survive. It repudiates the gladiatorial theory of existence.<sup>18</sup>

## The Limits of Science

The secularization of science that began from the nineteenth century has resulted in its elevation to the status of omniscience that it scarcely deserves. For example, the great evolutionist scientist Conrad Waddington famously declared in 1941 that 'Science by itself is able to provide mankind with a way of life which is ... self-consistent and harmonious ... So far as I can see, the scientific attitude of mind is the only one which is, at the present day, adequate to do this'.<sup>19</sup> Non-scientists have likewise perpetuated the myth of the limitless potentials of science. In his 1960 address to the National Institute of Science in India, the Indian politician Pandit Nehru observed:

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<sup>18</sup> Thomas Huxley, *Evolution and Ethics* (New York: D. Appleton, 1896), 83. Cited in Barbour, *Religion and Science*, 63.

<sup>19</sup> C. H. Waddington, *The Scientific Attitude* Harmondsworth: Penguin, 1941), 170.



It is science alone that can solve the problems of hunger and poverty, of insanitation and illiteracy, of superstition and deadening custom and tradition, of vast resources running to waste, of a rich country inhabited by starving people ... The future belongs to science and to those who make friends with science.<sup>20</sup>

The view that science is the only way to truth and that it can in principle explain everything is called scientism. This view is expressed eloquently by Peter Atkins who believes that 'There is nothing that cannot be understood'.<sup>21</sup> Science, according to Atkins, can therefore deal with every aspect of existence, from the microbes to human cultural achievements. Writers like Atkins argue that God and religious experience are simply not true because they lie outside the scope of science. Although believing in them may result in some psychological and even physical benefits, they are in the end delusionary. For them, believing in God is like believing in Father Christmas, goblins or fairies. Scientism therefore grows on the soil of scientific materialism that claims that the material world is all that there is.

The philosopher Mary Midgley has shown that scientism is closely connected to the Enlightenment's understanding of science. '[T]he Enlightenment notion of physical science was imperialistic from the outset', she writes. 'From its birth, the idea of this science was associated with two strangely ambitious claims, infallibility and the formal unity of the whole of thought'.<sup>22</sup> But scientism is intrinsically incoherent. Its logic is fatally flawed. The statement that only science can lead to truth is itself not a scientific statement. It cannot be deduced from science. This statement therefore expresses a certain philosophy of science, a particular view of the scientific enterprise. In short, it is a statement about science. But if the basic principle of scientism is true, if it is the really the case that *only* science can open us to the truth and that truthful statements *must* be scientific ones, then the statement about science that scientism makes is patently false. As the Cambridge mathematician and philosopher of science John Lennox has pointed out, scientism need not be refuted by external arguments. Scientism self-destructs because it is internally incoherent.<sup>23</sup> Furthermore, the implications of scientism are also incredulous. For if only science can deliver the truth, then there should be no need for all the other avenues of human knowledge that schools and universities have been exploring for centuries: philosophy, music, art, and literature, etc.

Just as scientism is baseless, so is its older cousin positivism. Older empirical positivism can be traced to the French philosopher of the Enlightenment Auguste Comte, who in fact coined the term 'positivism' in 1830. The history of positivism need not detain us. Pertinent to our discussion are the claims of positivism. Impressed by the natural sciences and mathematics, positivists sought to achieve objectivity and precision by demanding 'verification' for all statements. Only

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<sup>20</sup> Pandit Nehru, 'The Limitless Power of Science', in *Nature's Imagination: The Frontiers of Scientific Vision*, (Ed), John Cornwell (Oxford: Oxford University Press, 1995), 129.

<sup>21</sup> Peter Atkins, *Creation Revisited* (Hammerdswoth: Penguin, 1994), 1.

<sup>22</sup> Mary Midgley, *The Myths We Live By* (London: Routledge, 2004), 33.

<sup>23</sup> John C. Lennox, *God's Undertaker: Has Science Buried God?* (Oxford: Lion, 2009), 43.

statements than can be verified by science should be regarded as true. Other types of statements are deemed meaningless. Thus, statements made by metaphysics, religion and theology belong to the latter category. Positivism is defeated by the arguments forwarded by philosophers of science like Karl Popper, who incidentally was originally a member of the positivistic Vienna Circle. Popper, who later rejected positivism, questioned the demand for verification. He argues that not all scientific statements could be verified and so must be rejected as pseudo-statements. For example, the simple statement that 'all copper conducts electricity' cannot be verified, for to do so all the copper in the world must be examined and confirmed to possess this property, which is impossible. Popper therefore famously concluded that 'Positivists, in their anxiety to annihilate metaphysics, annihilate natural science along with it'.<sup>24</sup> Even positivism's understanding of 'meaning' must be subjected to criticism and ultimately rejected. Again, Popper has offered an incisive critique of positivism's approach to the issue:

All you have to do is to fix upon a conveniently narrow meaning of 'meaning', and you will soon be bound to say of any inconvenient question that you are unable to find any meaning in it. Moreover, if you admit as meaningful none except problems in natural science, any debate about the concept of 'meaning' will also turn out to be meaningless. The dogma of meaning, once enthroned, is elevated for ever above the battle. It can no longer be attacked. It has become (in Wittgenstein's words) 'unassailable and definitive'.<sup>25</sup>

Some scientists like Dawkins maintain that science is reliable because it is based on the empirical study of reality. Science therefore can prove its statements about the world. This view must be challenged because it fails to accurately describe the true nature of scientific theories and their limitations. For example, there are many competing theories about celestial motion offered by Eudoxus (400-347 BC), Ptolemy (AD 150), Copernicus (1473-1543), Tycho Brache (1546-1601) and Kepler (1571-1630). The fact that there are so many competing theories show that they cannot simply be tested against each other by observation. Other criteria of a philosophical and epistemic variety are needed. Many philosophers of science now no longer believe that theory-independent observation is possible. Furthermore, there are scientific theories that deal with unobservable entities like quarks and electromagnetic fields. As Alister McGrath has pointed out, science must use the word 'prove' more modestly. Prove must be taken to mean something like 'having reason to believe that this is the best possible explanation, but being aware that there are others that cannot always be excluded'.<sup>26</sup>

All this shows that despite all its achievements, science is profoundly limited by what it can do. It is not omniscient, as some would have us believe. Many scientists and philosopher recognize the limitations of science. The Spanish

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<sup>24</sup> Karl Popper, *The Logic of Scientific Discovery* (1934: London: Routledge, 2002), 13.

<sup>25</sup> Popper, *The Logic of Scientific Discovery*, 29.

<sup>26</sup> Alister McGrath, *The Re-Enchantment of Nature: Science, Religion and the Human Sense of Wonder* (London: Hodder and Stoughton, 2002), 165-6.

philosopher José Ortega y Gasset (1883-1955) celebrates the wonderful achievements of science and its ability to provide explanations for some aspects of the world we live in. But Ortega y Gasset maintains that science is unable to answer some of the most important questions that vex the human mind. Sometimes the evidence with which science deals points beyond itself to another world beyond the horizon, that is, to something beyond the grasp of science. He writes:

Science is but a small part of the human mind and organism. Where it stops, man does not stop. If the physicist detains at the point where his method ends, the hand with which he delineates the facts, the human being behind each physicist prolongs the line thus begun and carries it on to its termination, as an eye beholding an arch in ruins will of itself complete the missing airy curve.<sup>27</sup>

The arch that Ortega y Gasset sketches helps us to understand the relation between science and religion. The latter is not a leap of faith, but shares the same intellectual trajectory of science even if it is beyond the province of science. Science cannot deal with the limit questions which are in many ways always more fundamental to human existence than scientific ones. As Francis Collins, the Director of the Human Genome Project, has put it: ‘Science is powerless to answer questions such as “Why did the universe come into being?” “What is the meaning of human existence?” “What happens after we die?”’<sup>28</sup> Furthermore, science cannot give an account of ethics and moral responsibility, although geneticists, neuroscientists and evolutionary psychologists have tried. Their accounts are often reductionist and physicalist.

Stephen Hawking, who once thought that mathematics and physics would enable scientists to penetrate the ‘mind of God’, has recently changed his mind about this possibility. ‘If there are mathematical results which cannot be proved, there are physical problems which cannot be predicted’, he writes, ‘We are not angels, who view the universe from outside. Instead, we and our models are both part of the universe we are describing. Thus, a physical theory is self-referencing, like in Gödel’s theorem. One might therefore expect it to be either inconsistent, or incomplete’.<sup>29</sup> There are many aspects of reality that are beyond the grasp of science. Science certainly has no ability whatsoever to speak about God. The British philosophical theologian Austin Farrer puts this eloquently when he writes: ‘Every science picks out an aspect of things in the world and shows how it goes. Everything that lies outside such a field lies outside the scope of that science. And since God is not a part of the world, still less an aspect of it, nothing is said about God, however truly, can be a statement belonging to any science’.<sup>30</sup>

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<sup>27</sup> Quoted by Alister McGrath, *Surprised by Meaning: Science, Faith, and How We Make Sense of Things* (Louisville: Westminster John Knox Press, 2011), 40.

<sup>28</sup> Francis Collins, *The Language of God* (New York: The Free Press, 2006), 13.

<sup>29</sup> Quoted in Hans Küng, *The Beginning of All Things: Science and Religion* (Grand Rapids: Eerdmans, 2005), 20.

<sup>30</sup> Austin Farrer, *A Science of God* (London: Geoffrey Bles, 1966), 29.

## Science and the Christian Faith: A Dialogical Approach

Thankfully, many scientists and theologians have rejected both scientism and positivism and the conflict thesis of the relationship between science and religion they inspire. They are working to find creative ways of understanding the relationship between the two approaches to knowledge and truth. At this juncture, I would like to very quickly survey some of these approaches before expanding on my preferred model, namely the dialogical. The first approach has been described as the 'Independence Model'. According to this approach, science and religion are not in conflict with one another. But neither do they interact in any constructive ways with each other. According to this approach, science and religion are two fields of human inquiry that are quite distinct from each other and must therefore kept separate from one another. The questions that science deals with are different from those that religion is concerned about. The methodologies employed by these two fields are also distinctly different.

In his earlier work entitled, *Maker of Heaven and Earth*, the theologian Langdon Gilkey argues persuasively and eloquently in favour of this approach.<sup>31</sup> Science, according to Gilkey has to do with the study of objective, public, and repeatable data. Religion, on the other hand, reflects on the beauty of the world and the experiences of the inner life such as guilt, forgiveness and meaning. Science asks the 'how' questions that require objective answers, while religion is interested in the 'why' questions. Science is established on the authority of experiment, research and the logical coherence of its theories. Religion on the other hand is based on the authority of God and revelation. Science makes quantitative predictions that can be tested, while religion uses symbolic, metaphorical and analogical language to speak of the transcendent Reality. In a 1997 essay entitled, 'Non-Overlapping Magisteria' and later in his book, *Rock of Ages* (1999), Stephen Jay Gould also advances the proposition that science and religion occupy two different domains. Each has its own magisterium, and the two do not meet or overlap. He writes: 'the magisterium of science covers the empirical realm: what the Universe is made of (fact) and why does it works in this way (theory). The magisterium of religion extends over the questions of ultimate meaning and moral value. These two magisterial do not overlap, nor do they encompass all inquiry I consider for example, the magisterium of art and the meaning if beauty'.<sup>32</sup>

Although the independence model has some very attractive features, it is in the end inadequate. Religions like Christianity have some very definite things to say not just about God but also about the world in which we live. The natural world therefore cannot be studied or interpreted on its own. Furthermore, as we have seen, science always weds itself to a particular philosophy. This is because we are not contented with a plurality of unrelated languages concerning the world we inhabit. We seek a coherent interpretation of our experiences of the world, a unified theory.<sup>33</sup> The independence model also goes against the way in which we

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<sup>31</sup> Langdon Gilkey, *Maker of Heaven and Earth* (Garden City, NY: Doubleday, 1959).

<sup>32</sup> Stephen Jay Gould, *Rock of Ages: Science and Religion in the Fullness of Life* (New York: Ballantine Books, 2002).

<sup>33</sup> Barbour, *Religion and Science*, 89.

perceive and experience reality. We do not experience reality in neat and separate compartments. Rather we experience reality in their wholeness and interconnectedness. The independence model therefore appears to have introduced an artificial truncation and therefore distortion to our experience of reality.

The approach that I favour is that which sees science and religion – especially the Christian faith – as being in a dialogical relationship with each other. This means that although science and religion may be addressing different questions, there is a sense in which they are both reflecting on the same reality. The dialogical approach takes seriously the point raised by some that science works with certain philosophical presuppositions about the world. This means that science and religion can enter into dialogue at a number of critical levels. Religion can enter into dialogue with the sciences concerning their presuppositions. Dialogue can also be conducted on the methodologies pursued by the different fields. And science and religion can enter into constructive and fruitful dialogue about the key concepts explored by each of the disciplines. The dialogical approach is of course based on certain assumptions about science and religion. It addresses and challenges the assumptions behind the conflict model and the independent models that we have discussed. Although these models are quite different, they hold the view that science and religion are totally distinct from each other. While the dialogue model recognizes important differences between science and religion, it rejects the view that the two are so distinct from each other that it is impossible to bring them together in constructive conversation. This approach challenges the view that science is objective while religion is subjective, a view that is promoted and different developed in the conflict and independence models. For example, the dialogue model points out that scientific theories are theory-laden, not theory-free, and that it uses analogies and models to describe the object it is studying. Insofar as theological language is also dependent on metaphors and analogies, it has characteristics that are similar to scientific language.

Perhaps an example of what the dialogue between science and religion may look like is the various ways in which theologians have responded to the development of neuroscience and its implications to our self-understanding, especially the relationship between the brain and the self. On the one hand, neuroscience has underscored the importance of the body – especially the brain – in our concept of the self. The famous case of Phinas Gage is an example of the close relationship between the brain and behaviour. After recovering from a serious injury, Gage underwent a marked change in personality in which he is no longer able to observe social conventions and even make decisions, but somehow retained his intellectual abilities. Here neuroscience confirms a view long held by theologians, that the human being is a unity of body and soul. But some philosophers, influenced by neuroscience, have rejected the reality of the soul or the mind altogether, arguing that the decisions that we make – even moral decisions – are nothing more than the result of the activity of the brain hardwired in a particular way through a long evolutionary process. Theologians have rightly questioned if such a physicalist view of the human being can really do justice to every human activity. They maintain that physicalism is in the end reductionist because it fails

to give a convincing account of a whole range of emotions, actions and achievements that are attributed to the human race. Of course, the issues involved in the conversations between neuroscience, philosophy and theology are far more complex than the sketch that I've just made. But I hope that it gives us an idea of how science and religion (theology) can enter into fruitful dialogue.

But the dialogue between science and the Christian faith can be conducted at an even more basic level. This brings us back to the idea of 'limit questions' that I alluded to earlier, which, according to theologians like Thomas Torrance, are questions which science may raise but which it is unable to provide an answer. Torrance argues that the nature of our world itself presents these limit questions. The world in which we live in, the world that science attempts to investigate and understand, is both contingent and intelligible. The world is contingent in that its laws and initial conditions are not necessary. Put differently, the contingency of the world points to the plausibility of the existence of a different world, with different laws and conditions. Yet it is this world, with this set of laws and conditions, that exists, not another world with different configurations. But because this world does exist with this set of laws, it is intelligible: it is something that we can study and, to some extent at least, understand. The combination of the contingency and intelligibility of our world prompts us to ask limit questions like, 'Why is there a universe at all?' and 'Why is our universe like this, and not like some other possible universes?' The Christian faith answers such limit questions by pointing to the sovereign and rational Creator, who has brought our contingent and intelligible world into being. Thus, Thomas Torrance writes: 'Correlation with that rationality in God goes far to account for the mysterious and baffling nature of the intelligibility structure in the universe, and explains the profound sense of religious awe it calls forth from us and which, as Einstein insisted, is the mainspring of science'.<sup>34</sup>

There are, of course, those who chose to ignore these questions and the answers urged by the Christian faith and conclude that the universe and human existence are meaningless. Ursula Goodenough, a cell biologist, tells of how the idea of the meaninglessness of the universe plagued her to the point that she simply stopped thinking about it. Reflecting on the scientific account of the destruction of the universe, she writes: 'Our sun too will die, frying the Earth to a crisp during its heat-death, spewing its bits and pieces out into the frigid nothingness of curved spacetime'. Her scientific work had obviously brought the limit questions about life to the surface. But in refusing to go beyond science to look for possible answers, her scientific pursuit itself has become meaningless. She writes: 'The more the universe seems comprehensible, the more it seems pointless'.<sup>35</sup> No matter how strenuously we try to avoid or suppress the limit questions, they simply won't go away. This is because we are all meaning-seeking creatures, capable of self-transcendence and aware of the reality that surrounds us in ways that non-human animals are incapable of. Consequently, we are dissatisfied with purely materialistic explanations of the world. We sense not only the fact that such explanations are incomplete, but that they are incapable of helping us to make sense of many things that we encounter in life. As the British author Iris

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<sup>34</sup> Thomas Torrance, 'God and the Contingent World', *Zygon* 14 (1979): 347.

<sup>35</sup> Ursula Goodenough, *The Sacred Depths of Nature* (Oxford: Oxford University Press, 1998), 10.

Murdoch has so memorably put it, there is a 'calming, whole-making tendencies in human thought' that we cannot resist. We look for philosophical / religious accounts of reality because we ask big questions about that reality to which our sciences cannot supply adequate answers.

Ursula Goodenough has tragically shown us that if we look at the world the wrong way, it will appear meaningless to us, and no matter how sophisticated our sciences may eventually develop they cannot inject meaning to it. The Christian faith, however, is able to provide us with the framework within which to view reality and ourselves and give us a sense of the purpose of our existence. C. S. Lewis has a delightful way of bringing this across: 'I believe in Christianity as I believe that the Sun has risen, not only because I see it, but because by it, I see everything else'.<sup>36</sup> The framework that Christianity provides is not discovered by us – and certainly not by our sciences. It is disclosed to us in God's dealings with his people Israel in the old covenant, and finally and supremely in the life, death, resurrection and ascension of the incarnate Son of God. To the question, Who Am I?, the Christian faith answers that I am created by a loving God in his image and likeness. Do I Matter? Yes, I do, to God, because he has created us in all my uniqueness and has called to eternal communion with him. Why Am I Here? I am here to worship God, to serve him and to enjoy him forever. These are profound answers to the big questions that all of us are asking, that our scientific pursuits themselves prompt us to ask. To some these answers may appear rather simplistic. But in truth they are profound answers that men and women of faith have pondered for thousands of years. They have served as the intellectual and spiritual resources and have provided countless of believers with meaning and hope. These are responses that merit careful elucidation and exposition. But that is the task of another lecture.

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<sup>36</sup> C.S. Lewis, 'Is Theology Poetry?' in *C.S. Lewis: Essay Collection and Other Short Pieces*, ed. Lesley Walmsley (London: Harper Collins, 2000), 21.