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Alister McGrath

This article explores the biblical foundations and historical development of natural theology, noting in particular its relationship with the emergence of the natural sciences. After considering some questions of definition, the biblical foundations of natural theology are considered, followed by a detailed historical engagement with its development within the theological tradition during the patristic period, the Middle Ages, the Renaissance and Reformation, and the early modern period. The concept of 'physico-theology', which emerged during the seventeenth century, is of particular significance in highlighting the close interaction between natural theology and the emerging natural sciences. Although early modern natural theology tended to focus on the physical sciences, interest in the potential of the biological world for natural theology became increasingly important, and is perhaps seen at its zenith in William Paley's *Natural Theology* (1802).

Yet Darwin's theory of evolution through a process of natural selection called into question Paley's idea of a divine watchmaker, suggesting that complex biological structures emerged through the unguided natural process of evolution. The challenges raised by Darwin and his successors for natural theology are carefully evaluated. Yet although Darwin raised some difficulties for traditional forms of natural theology, the growing twentieth-century realization that the universe came into existence with properties that seemed to be fine-tuned for life created new interest in this approach. These approaches are noted, before the article concludes with some wider reflections on the interaction between natural theology and the sciences, particularly the possibility that natural theology might serve as a bridge between science and religion.

Keywords: Natural theology, Natural philosophy, Revelation, Book of Nature, Physico-theology

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1 Introduction

Natural theology deals with the link between the natural world and God. It is a rich notion, which can be interpreted in several ways. For some, knowing God as creator allows us to see the natural world in a deeper and more meaningful way. For others, nature points towards God, helping us to grasp something of God's wisdom and character. The created order points beyond itself, inviting us to explore what lies past its limiting horizons. 'The pursuit of discovery', Michael Polanyi suggested, is 'guided by sensing the presence of a hidden reality toward which our clues are pointing' (Polanyi 1967: 24). There are important links between natural theology and systematic theology, the philosophy of religion, spirituality, and apologetics. This article will explore the rich heritage of natural theology, including the various ways in which it has been understood, and the debates about which of these ways is to be preferred.

Since the origins of recorded history, human beings have reflected on the significance of the natural world within which they find themselves. Some rightly realized that a proper understanding of the natural world was important for human survival and flourishing – such as being able to predict the flooding of the River Nile, or developing astronomical tools for navigation (Winkler 2021). Others, such as Aristotle (Leroi 2014), saw the natural world as a complex reality which called for understanding – an enterprise initially understood as 'natural philosophy', and subsequently as 'natural science'. Yet a third line of approach began to emerge in late classical antiquity (Naddaf 2004). Might the natural world be a sign to some greater transcendent reality which lies beyond it? The term 'natural theology' is now widely used to designate the intuition that there is some intellectual or imaginative connection between the natural world and a transcendent reality, such as God (Vidal and Kleeberg 2007; McGrath 2016). Many see this echoed in the wisdom literature of the Old Testament, such as Psalm 19:1: 'The heavens declare the glory of God.'

Although the term 'natural theology' was used in some philosophical works of classical antiquity, it did not find widespread acceptance within Christian theology during the patristic period, or the early Middle Ages. The widespread adoption of the notion is relatively late, dating from the early modern period, when the term 'physico-theology' (from the Greek physis, 'nature') began to be used by natural philosophers such as Robert Boyle in the seventeenth century (Blair and Greyerz 2020). For Boyle, 'physico-theology' was an understanding of God which resulted from a close reading of the 'Book of Nature'; while this understanding was not identical to that resulting from reading the 'Book of Scripture', the two were certainly capable of being harmonized. The growing cultural importance of the natural sciences since Boyle's time has led to an understandable focus on approaches to natural theology based upon teleological considerations, often leading to a regrettable narrowing of its vision.

While the rise of ‘physico-theology’ gave prominence to approaches to natural theology which emphasized the ordering or design of nature, other approaches have been part of this wider enterprise. Arguments for the rationality of theism based on an appeal to the beauty of nature, the contingency of the cosmos, and human religious experience are all part of the rich fabric of natural theology. Yet the diversity of possible approaches to natural theology raises some important questions about the coherence of the notion (Stratton 2000; Oppy 2006). Is there a plurality of natural theologies, or is there some underlying grander vision of natural theology that can accommodate this plurality, allowing each element to be seen as an integral element of a greater whole? (McGrath 2016: 22–35).

To speak of ‘natural theology’ is to point to the need for clarity about what is to be understood by the term ‘nature’. Some focus on the natural capabilities of human reason, by which human beings naturally intuit the existence of a transcendent reality, and develop modes of justification for this belief without reference to divine revelation. Others focus on the realm of nature itself, including human beings, focusing on its intricacy and complexity. Others extend such a vision of nature to include the world of human culture, seen as a ‘natural’ construction which points to the capacity of both natural and human artistic beauty to disclose a greater vision of reality, and thus highlight the importance of the arts in relation to natural theology (Monti 2003; Brown 2006; Graham 2007; Stump 2007).

2 Questions of definition

The intuition that there is a connection between the world of nature and a transcendent realm can be developed in a number of ways, with the result that the term ‘natural theology’ is now understood in a variety of senses (Fergusson 2007; Re Manning 2013; McGrath 2016: 18–22). ‘Natural theology’ is not a ‘natural kind’, but is rather a contested notion, which has been formulated in a variety of ways, often reflecting specific cultural or intellectual opportunities or challenges, or the emerging professional habits of certain communities of discourse (such as the philosophy of religion: Craig and Moreland 2009). The following understandings of the term are widely encountered in contemporary writings:

1) Natural theology is the enterprise of using purely human intellectual resources – such as reason and other natural perceptual faculties such as intuition and imagination – to demonstrate the rationality of belief in God independently of divine revelation. Anselm of Canterbury’s ‘ontological argument’ is a good example of such an approach (Leftow 2005), in that it is a reflection on human thought processes which does not depend on any insight derived from revelation. This has become the normative (or at least predominant) understanding of the term for modern philosophy of religion. William Alston’s definition of natural theology would command wide assent within this discipline: it is ‘the enterprise of providing support for religious beliefs by starting from premises that neither are nor presuppose any religious beliefs’ (Alston 1991: 289). This might involve reflection on

the natural world, or exploring certain ideas that seemed to be ‘natural’ or ‘innate’ to the human mind (Barr 1993: 1).

2) Natural theology is working out what can be known of God from a close study of the ‘Book of Nature’, which may be supplemented by a reading of the ‘Book of Scripture’. This approach, found in Robert Boyle’s *Excellence of Theology compared with Natural Philosophy* (1664), did not consider natural theology to be a rival or alternative to traditional Christian theology; it was widely assumed that these were compatible, though differing in emphasis and approach (Tanzella-Nitti 2004; Hunter 2009). As we shall see, this way of conceiving natural theology, now generally referred to as ‘physico-theology’ to indicate its specific cultural location, reflects some of the religious assumptions and concerns of the early modern period, particularly in England.

3) Natural theology is about exploring the congruence or resonance between a shared human experience of nature on the one hand, and belief in God on the other. Perhaps the most familiar form of this approach is found in the works of John Polkinghorne in the late 1990s, although the roots of the approach lie much earlier. For example, Joseph Butler’s classic *Analogy of Religion* (1736) draws on a sophisticated account of the convergence of human reason and divine revelation, often focusing on aspects of the natural order and human experience (Penelhum 1999: 89–112). This approach is particularly appealing to natural scientists with religious commitments, as it offers an accessible and helpful way of framing the relation of their faith and scientific projects (see The History of Science and Theology).

4) Natural theology is the way of seeing or imagining the natural order from within the Christian faith. This approach, which amounts to a ‘theology of nature’, takes its starting point from within the community of faith and constructs an account of the world of nature when seen and understood from this perspective (Morley 2003: 97–120). The intellectual trajectory here is not from the human capacity to reason, or rational reflection on the natural world, to God, but rather seeing God as an explanation of the human capacity to reason in the first place.

Other styles of natural theology could be noted, including approaches that call into question the adequacy of a purely materialist account of nature – an approach particularly associated with the philosopher Alvin Plantinga (Sosa 2007). The point to appreciate, however, is that the term ‘natural theology’ is used in a number of quite distinct senses, making it important to ascertain what specific understanding of natural theology underlies any particular discussion or informs any statement. We shall return to this point on several occasions in this article.

3 The biblical foundations of natural theology

Perhaps the first insight of relevance to natural theology that a reader of the Old Testament would gain, if following the canonical ordering of its books, is that the natural world is God's creation (Wenham 2014). The first chapters of the book of Genesis contain two creation accounts, diverging in their emphases, and at points in terms of their substance (for example, they differ in the order of creative events). Both affirm that the multiple components of the natural world – including human beings – are to be seen as divine creations. Where some ancient near eastern religious traditions saw the sun, moon, and stars as divine in their own right, Genesis portrays them as God's creations, and hence as subordinate to God.

Although some readers of Genesis used questionable exegetical assumptions to suggest that the chronology of creation could be determined from the text itself, most scholarly interpreters argue that the key point being made does not relate to the dating of this event, but to its theological significance. The Old Testament wisdom literature frequently affirms themes that are linked with most forms of natural theology – such as the ordering, beauty, complexity, and vastness of the created order (Barr 1993: 81–101).

Yet the Genesis creation account also highlights an important point about human beings: they bear the 'image of God'. This theme is somewhat underdeveloped in the remainder of the Old Testament, and various interpretations of its significance have been offered by scholars and theologians (Middleton 2005). Some see this as a mark of human subjugation to God; others interpret this as affirming that humanity shares in the divine prerogative to rule the created order. Some see this as undergirding humanity's created capacity to relate to God; others as grounding the human ability to make sense of the created order. Athanasius of Alexandria, for example, suggests that humanity's bearing the image of God is linked with being able to discern the creation as the work of God, and thus avoid worshipping the natural world in an idolatrous manner (Meijering 2010: 180–184).

Earlier, we noted the famous declaration of Psalm 19:1: 'The heavens declare the glory of God.' What might this mean? Although some interpret this to mean that the beauty or vastness of the heavens prove or suggest the existence of God, this is not what the Psalmist had in mind. The best way of understanding this Psalm is to see it as affirming the connection between nature and the Law (torah) as distinct though connected ways of disclosing God's glory (Howell 2009; Sommer 2015). The God whose glory is disclosed in the creation is the same God who is known through salvation history and the giving of the Law.

These ideas were developed further at a later stage. Hellenistic Judaism explored themes that were clearly of potential importance to natural theology (Collins 1998). For example, the *Wisdom of Solomon* – a work regarded as lying outside the main body of Scripture by Protestants, and which probably dates to the middle of the first century BCE – uses

language that clearly creates intellectual space for some form of natural theology. It affirms that human beings could arrive at an authentic, though not complete, knowledge of God without the need of divine revelation. In some ways, this work anticipates Paul's discussion of a natural knowledge of God in the New Testament. Its significance lies especially in its critique of the crude idolatry that was typical of popular paganism around this time. If the glory of God can be seen in the beauty of nature, why waste time worshipping idols?

The New Testament offers several insights that are clearly relevant to various forms of natural theology (Barr 1993: 21–57). The first, and perhaps most important, is that humanity ought to be able to infer or intuit the existence and character of God from reflection on the natural order. This is stated in a positive manner in Luke's account of Paul's Areopagus oration at Athens (Acts 17:16–34; cf. Gärtner 1955; Jipp 2012), and in a more negative manner in Paul's letter to the Romans (Rom 1:19–20; cf. Jewett 2007: 148–156). While no theological explanation is offered for this human capacity to discern God through creation, it is clearly seen as significant, and would be developed by later Christian theologians into an account of two different types of knowledge of God: knowledge acquired through nature, and knowledge acquired through the reading of the Christian Bible, or the tradition of biblical interpretation.

The second insight that has played a significant role in Christian thinking about natural theology is that Jesus Christ is to be seen as the incarnate 'word (Greek: *logos*) of God'. The Greek term *logos* conveys rather more than the English term 'word'; it hints at the idea of rationality, leading theologians such as Irenaeus of Lyons and Athanasius to argue that the rationality through which God created the world is embodied in Christ (Anatolios 2018). This is linked with the distinctively Christian idea that Christ is the *agent* of creation, clearly stated in the prologue of John's gospel (John 1:3), and more formally expressed in the creedal statement that Christ is the one 'through whom all things were created'. This link between the incarnation and the intelligibility of the world has proved theologically fertile; it was further developed, for example, by Thomas F. Torrance, who suggests that 'the incarnation has the constant effect of affirming the contingent intelligibility of the creation' (Torrance 1981: 33–34).

These ideas played a significant role in shaping the Christian tradition, not merely in relation to natural theology, through a process of reflection on how best to interpret the Bible, but also to engage in dialogue with other traditions of thought that were seen as culturally and intellectually significant – such as Platonism in the period of the early church, and Aristotelianism in the early Middle Ages. While neither the Old nor New Testaments can be said to develop a 'natural theology', they do provide some fundamental building blocks which can be incorporated in a variety of ways into such theologies.

4 The early history of natural theology

The first great phase of theological development dates from the period of the early church. Christianity was not regarded as a legal religion within the Roman empire until the early fourth century, forcing Christian theologians to write and preach in secret. However, with the conversion of the emperor Constantine, Christianity was recognized as a legal religion, and theologians were free to work publicly. Two major topics dominated early Christian theological discussions; the identity and significance of Jesus Christ, and the Christian doctrine of God (Pelikan 1993; Ayres 2004). The christological debates of the period concerned how best to understand the relation of humanity and divinity within the person of Christ; the trinitarian debates concerned developing a coherent understanding of the nature of God which was able to enfold the biblical witness on this matter, particularly in the light of the growing consensus within the community of faith that the Holy Spirit had to be recognized as divine.

Apologetics quickly emerged as a significant element of Christian outreach to the wider culture of the Roman empire. In the second century, Justin Martyr set out a defence of Christianity which presented Christianity as the fulfilment of the human desire for wisdom, as well as a fulfilment of the Jewish Law. Justin developed what could now be seen as a natural theology, aiming to show that Christianity was 'natural', and would be seen as such by any reasonable cultured person (Chadwick 1993).

Despite the presence of various elements of what has come to be known as natural theology in the emerging early Christian apologetic tradition, there was, however, no explicit discussion of the topic of natural theology in this phase of theological reflection; indeed, the Latin term theologia naturalis was rarely used during this period in Latin-speaking Christianity. Augustine of Hippo explicitly uses the term in the sixth book of his classic early fifth century work *The City of God*. Augustine here speaks of three theologies: mythical, natural, and political, borrowing these terms from the Roman philosopher Terentius Varro. Yet having noted this approach, Augustine seems to have found little use for it in his own theological reflections (Pelikan 1993: 22–39; 184–230).

However, in both the eastern and western churches, issues that implicitly raised questions relating to natural theology emerged as significant, particularly as Christian theologians engaged secular culture. As we have seen, the discipline of 'apologetics' emerged as important in both the eastern and western churches, aiming to demonstrate the intrinsic rationality and appeal of Christianity to Roman, Greek, and Jewish audiences. While apologists who engaged Jewish audiences generally focused on showing how Christ fulfilled the aspirations and prophecies of the Old Testament, those engaging Roman and Greek audiences often used forms of natural theology to demonstrate that Christianity offered a more persuasive account of the world than its pagan alternatives – often by engaging Greek and Roman philosophers who explored the question of the link between

the natural world and the gods (Pelikan 1993), and presenting itself as a ‘philosophy’ which fulfilled the human quest for wisdom (Löhr 2010).

The classic Roman lawyer and philosopher Cicero, for example, was clear that the natural world pointed to the existence of the gods. In his influential work On the Nature of the Gods (45 BCE), Cicero asserts that almost no philosophers seriously believed in atheism or agnosticism. For Cicero, many Romans were disturbed or puzzled by their ancestral religion, which often seemed unsophisticated. Cicero can be argued to provide a more robust intellectual foundation for these traditional religious beliefs and practices through an appeal to Hellenistic philosophy. Many Christian theologians argued that the Christian idea of God was far more satisfactory as a solution to the problems Cicero identified, and presented Christianity as the fulfilment of classical wisdom. It proved to be a popular and enduring strategy: more than a thousand years later, John Calvin developed a similar argument. In his *Institutes of the Christian Religion* (1960), Calvin argued that the Christian notion of God resolved some of the ambiguities in Cicero’s thinking about the natural knowledge of the gods (Grislis 1971).

5 Natural theology in the Middle Ages

The early Middle Ages witnessed a significant revival of interest in the themes of natural theology, even though this term was generally not explicitly used at the time. The twelfth-century theological renaissance in western Europe saw a new interest in ‘natural philosophy (*philosophia naturalis*)’ – a term that was widely used at this time to refer to making sense of the structures and behaviour of the natural world, which often involved making theological connections (Grant 2007: 143–165). The twelfth-century Parisian theologian Hugh of St Victor played an important role in developing the idea of nature and the Christian Bible as ‘God’s Two Books’, which could be read side by side (Mews 2005). The image of ‘God’s Two Books’ led theologians to suggest that the well-established hermeneutical tools used to interpret the Bible could be applied to the natural world, thus opening the way to the new interpretative empirical approaches to nature that emerged in the late sixteenth century (Harrison 1998). Yet more importantly, a tool was established to enable the correlation between Christian reflection on the Bible and reflection on the natural world. These two texts, both ‘authored’ (although in different modes) by the same God, could be read together with each other, thus enabling a form of natural theology.

During the thirteenth century, the leading Dominican theologian at the University of Paris, Albert the Great, laid down the principle that while the discipline of theology was based on divine revelation, the discipline of natural philosophy was based on common human reason (Collins 2010). It was an important and influential statement, which was developed further by his successor at the University of Paris, Thomas Aquinas. For Aquinas, natural theology is part of the broader enterprise of metaphysics, which aims to find the ultimate

explanation of reality. This explanatory undertaking leads him to posit God as a wholly simple, immutable being who in the final analysis is identical to Being itself.

Aquinas famously developed his ‘Five Ways’ for demonstrating the reasonableness of belief in God (Kerr 2015; Schumacher 2016). Although these are often referred to as ‘proofs’ of God’s existence, Aquinas does not use this way of speaking. What is particularly interesting is that each of these five ways takes its starting point in an observation of nature, in the broadest sense of the term. We shall consider two of these briefly. The first of these ‘Ways’ argues from the observation of natural motion or change (Latin: *motus*) to infer the existence of a first mover who sets things in motion, namely, God. The second ‘Way’ begins with the observation of effects within the natural world, and argues these point to a divine cause of those effects. The fifth ‘Way’ begins with the observation of order or purpose on the part of natural beings and the natural world, and argues for God as the cause and ground of such order and purpose.

While Aquinas does not use the term ‘natural theology’ to refer to his approach in these arguments, these can easily be correlated with some modern approaches to this topic. Although Aquinas’s best-known work is his *Summa Theologiae*, the work which best illustrates his interest in natural theology is the *Summa contra Gentiles*, which offers a defence of the rationality of the Christian faith, using both the natural faculty of human reason and reflection on the natural order (Kretzmann 1997).

A further development of importance to natural theology was due to the Franciscan theologian Duns Scotus and his successors. The concept of *haeccitas* (‘this-ness’) emerged during the fourteenth century as a means of capturing and preserving the distinct identity of any particular aspect of the natural order. Although this concept was important for the philosophy of religion, it was adopted in the nineteenth century by the Jesuit poet Gerard Manley Hopkins, who used it as the basis of a heightened attentiveness to the individual aspects of nature (Boggs 1997), which is particularly evident in his 1877 poem ‘As Kingfishers Catch Fire’.

6 Natural theology in the Renaissance and Reformation

The Renaissance witnessed a resurgence of wider cultural interest in the classic philosophical and literary traditions, as well as a renewed engagement with the New Testament. The programmatic return *ad fontes* (‘back to the sources’) generated a new interest in approaches to natural theology found in Greek and Roman writers, even though this specific term was not widely used at this time. The image of ‘God’s Two Books’, noted earlier, proved particularly important in sustaining theological interest in the natural world

(Howell 2002; Tanzella-Nitti 2004). Reflective contemplation of the beauty and grandeur of the natural world was seen as an act of devotion to God the creator.

One of the most important works that shaped the modern discussion of natural theology was published in Spain in the late fifteenth century. In his *Liber Creaturarum* ('The Book of the Creatures'), the Catalan theologian and philosopher Ramón Sibiuda (also known as Raymundo of Sabunde), developed the idea that the natural world was able to disclose the grandeur and beauty of God. For reasons that remain unclear, later versions of this work used a range of titles, including *Theologia Naturalis sive Liber Creaturarum* ('Natural Theology, or, The Book of the Creatures'). In the view of many scholars, this work established the use of the term 'Natural Theology'. However, Sibiuda did not see natural theology as having an apologetic role; if anything, Sibiuda's version of natural theology is more akin to a spirituality of nature, which encourages a deepened appreciation of the wisdom of God through contemplation of God's created order (McGrath 2016: 13–16).

The French humanist writer Michel de Montaigne translated this work into French in 1559 as *La théologie naturelle* ('Natural Theology'), pointing out that Sibiuda's approach might prove helpful in countering the rise of atheism and skepticism since Sibiuda's time (Habert 2010). This recognition of the apologetic importance of natural theology reflected Montaigne's specific historical context, which was very different from that of Sibiuda himself. However, the continuing presence of such sceptical currents of thought in western culture ensured that the apologetic potential of natural theology was increasingly recognized and applied in the seventeenth and eighteenth centuries in western Europe.

The Protestant Reformation of the sixteenth century, especially associated with Martin Luther and John Calvin, witnessed a major return to biblically-based theology and preaching. Although Luther himself had little interest in natural theology, his colleague Philip Melanchthon developed a form of natural theology which created conceptual space for the study of the natural order, and reflection on its apologetic and spiritual significance (Methuen 1996). This form of natural theology can be seen in the works of the famous astronomer Johannes Kepler, who interpreted the regularity of the solar system in terms of the harmonious vision of the world affirmed by the Christian doctrine of creation (Stephenson 2014).

While presenting his influential *Institutes of the Christian Religion* as a guide to the correct interpretation of the Bible, Calvin nevertheless emphasized the importance of knowing God through nature, as a gateway to discovering the richer vision of God offered by Christianity (Léchot 2018). Calvin's positive attitude towards the study of nature is often cited as an important stimulus to the development of the natural sciences within Protestant Europe. For Calvin, nature pointed towards God in two distinct manners: in the external ordering and beauty of the natural world, and the internal 'sense of divinity' experienced

by human beings, irrespective of their cultural location. Calvin did not see these two aspects of natural theology as proving the existence of God; he did, however, see them as harmonious with the biblical witness, and offering an invitation to explore the richer and clearer biblical view of God in greater depth. A natural knowledge of God as creator was thus a prelude or gateway to a saving knowledge of God as redeemer.

7 Early modern natural theology

The early modern period saw natural theology emerge as a significant domain of thought, catalysed partly by the growing reputation and social impact of the natural sciences, and by a need to find common ground in order to engage the increasingly significant atheist and sceptical trends within western European culture. This can be seen in the shifts in the way in which theology was taught at the Genevan Academy (Klauber 1994). Calvin had stressed the possibility of making connections between the world of nature and the Christian faith in the 1550s. By the 1700s, this had shifted to a defence of the rationality of the Christian faith through an appeal to natural theology, often drawing on arguments developed by English religious writers confronted with the rise of rationalism and scepticism.

A number of factors are thought to have influenced this increasingly high profile of natural theology, particularly in England, accompanying the rise of ‘natural philosophy’ as a coherent intellectual domain which enfolded theological concerns (Lüthy 2000; Janiak 2012). The term ‘physico-theology’, deriving from the Greek term for nature (physis), was now widely used to refer to approaches to theology that were based on observation and interpretation of the orderedness, complexity, and beauty of the natural world (Harrison 2005; Mandelbrote 2007; Blair and Greyerz 2020). The European Wars of Religion led many to conclude that difficulties in interpreting the Bible pointed to the need to find another publicly-available resource which could be the basis for reflection on ethics and religion. Many saw the natural world as an obvious choice for such a resource. There was a new interest in the metaphor of ‘God’s Two Books’, enabling the natural sciences to be brought into dialogue with religion. Distrust of religious institutions and their clergy also led to interest in exploring more personal and individualist versions of faith, some of which were grounded in an appreciation of nature as God’s creation. For some religious writers, physico-theology was an important apologetic tool that allowed one to maintain the public plausibility of Christianity, while at the same time forging important intellectual and institutional connections between science and religion in a period of rapid social change.

Richard Westfall has highlighted how this approach to theology offered a means of doing (or at least valuing) theology without becoming involved in partisan and sectarian debates about the sources and norms of theology, which had become particularly significant in the fraught political and religious atmosphere following the English Civil War (Westfall

1992). For Westfall, three factors were particularly significant. First, the rise of biblical criticism called into question the reliability or intelligibility of the 'Book of Scripture', and thus led to exploration of the theological significance of the presumably less problematic 'Book of Nature'. Second, a growing distrust of ecclesiastical authority led some to explore sources of knowledge which were seen to be independent of ecclesiastical control, such as an appeal to human reason – or, of course, to the natural order. Both reason and nature were seen as standing above the religious conflicts of the time. Third, a suspicion of the dogmatism associated with organized religion and certain Christian doctrines caused many to search for a simpler form of religious belief and practice, more closely connected with the natural world. The rise of Deism, which dates from this period, set to one side theological notions that were seen as needlessly abstruse (such as the doctrine of the Trinity), and instead focused on the somewhat minimalist theme of God as creator (Wigelsworth 2009). To its critics, Deism was theologically impoverished; for its supporters, it represented the lowest common denominator version of theism, which avoided the divisive and destructive religious controversies of the age.

By the early eighteenth century, natural theology was seen as having given a new plausibility to religious faith in an increasingly scientific culture. Newton had shown that certain fundamental forces and principles seemed to apply throughout the observable universe, offering important intellectual support to the notion of an ordered divine creation. Alexander Pope's tribute to Newton following his death in 1727 is well-known:

> All Nature and her Laws lay hid in Night.
> God said, *Let Newton be*! and All was *Light*.

Natural theology also began to flourish in North America at this time. Jonathan Edwards, who played a critically important role in the 'Great Awakening' in colonial America, developed approaches to natural theology which parallel that of 'physico-theology'. For Edwards, God's existence and wisdom were confirmed by the order and harmony of nature. Yet while some of Newton's followers used mechanical imagery and analogies to express the regularity and ordering of the natural world, Edwards tended to appeal directly to the beauty of nature, arguing that creation was only intelligible in light of its divine origins and imprint (Zakai 2010). Nature was not merely ontologically dependent upon God; God had created it in order to express and communicate the divine 'excellency' to humanity.

Yet by the second half of the eighteenth century, Newton's natural theology was being viewed somewhat more critically. Its emphasis on the ordering of nature, and the capacity of the human mind to grasp and represent this, seemed to reduce God's role to designing and creating the world. To its critics, this seemed to make God an irrelevance. God created the universe in the past, but did not superintend it in the present, or become involved in the lives of human beings. God might have retired, or even died; yet the universe would

continue to function as usual, in that it did not depend upon God for its operation. Popular Newtonian writings – though not Newton himself – spoke of the universe as a mechanism, to be compared to a clock. God was the clockmaker; having created the world and set its operation in motion, there was no longer any need for God.

David Hume's criticisms of 'natural religion' further diminished the appeal of this form of natural theology (Bradley 2007). In his *Dialogues concerning Natural Religion* (2007; first published 1779), Hume pointed out that these arguments could easily lead to a multiplicity of creators, and failed to take account of what he considered to be imperfections in nature. The world could, Hume argued, have been the first botched attempt at creation on the part of 'some infant deity', or the 'production of old age and dotage' of some creator God who had lapsed into an incompetent senility. Nature could not confirm the existence or communicate the nature of God without the use of bridging assumptions.

Leibniz offered a clear move here away from approaches to natural theology based on a Newtonian 'mechanical philosophy' stressing the ordering of the world towards one which acknowledged the significance of the *contingency* of the world. In the late seventeenth century, Leibniz came to hold that the laws of nature are 'paradigmatically contingent', and can thus provide the basis for a new argument from design, in that they appear to presuppose the existence of an active, goal-directed agency (McDonough 2010).

Yet many were in the process of turning away from reflection on nature in general for access to the transcendent, and focused instead on one specific aspect of nature – the human mind. Writers such as Immanuel Kant moved away from reflecting on the ordering of the natural world to focus instead on the human perceiving subject. Although this trend is anticipated in certain respects by some Cambridge Platonists of the seventeenth century (Mandelbrote 2007), it became particularly influential in late eighteenth and early nineteenth century Germany through the influence of Kant and Friedrich Wilhelm Joseph von Schelling (Krüger 2011).

In his *Critique of Pure Reason* (1781), Kant argued that natural theology aims to infer the existence of God as the ultimate cause of the world. Yet since causes and effects are properties that are limited to the empirical realm, it is not possible to infer the existence of God as a cause from observation of the world. For this reason, speculative theoretical reason, when applied to the study of nature, is unable to yield theological knowledge. Kant's influence led to a refocusing on 'the perceiving subject rather than the composition of the world', which amounted to a 'rejection of natural theology in favour of moral theology' (Young 2017: 377). Yet critics of Kant, such as Richard Swinburne, have pointed out that applying categories derived from experience to something that cannot be experienced does not entail that we cannot have knowledge of the latter (Swinburne 2012).

8 Early nineteenth-century natural theology

In the opening years of the nineteenth century, natural theology began to enjoy a resurgence in England, perhaps contributing to the wider renewal of Christianity within British culture during this century. William Paley's *Natural Theology* (Paley 1802; cf. Fyfe 2002) became a classic work of popular religious apologetics, offering a carefully reasoned theistic account of biological complexities which, without explicitly engaging Hume, managed to sidestep his objections to natural theology. Whereas Aquinas drew on a rich metaphysical vision in making theistic sense of the world (Feser 2009: 110–120), Paley offers a thinner approach, with a focus on the explanatory capacity of the hypothesis of a divine 'artificer'. Where Newtonian natural theology had focused on the regularity of the physical world, Paley extended this approach to the biological realm, arguing that the complexities of structures such as the beautiful hinge of a bivalve shell were more fruitful apologetically than an appeal to the appearance of the stars (Gliboff 2000).

Although the analogy of God as a watchmaker had been used in the eighteenth century to illuminate the religious significance of the laws of nature, Paley repurposed this analogy in order to explore the apologetic significance of the complexity of the biological world. It was, he argued, unsatisfactory to simply accept the brute fact of the existence of a complex world; an explanation for its complexity was required (Eddy 2004; Topham 2010).

Paley's core contribution to creating a positive popular reception of natural theology was his intricate descriptions of the complex aspects of biological systems, such as the human eye, and his core argument that these are best understood as analogous to machines or instruments that had been 'contrived' – that is, designed and constructed in order to achieve a specific goal. Paley was writing during the period of the Industrial Revolution in England, and was able to exploit popular interest in new industrial technology. Biological organisms, he argued, showed the same characteristics of design and construction that were associated with telescopes and spinning-machines. Since these could not have arisen by chance, they could only be explained by divine design and construction. To demonstrate contrivance within nature was thus also to demonstrate the existence of God. However, Paley's view that nature did not develop over time would prove to be deeply problematic.

Paley's argument clearly achieved a significant degree of cultural traction, partly due to his clear writing style, the force of his controlling image of God as watchmaker, and his eloquent and thorough descriptions of both natural objects and the manner in which his theory accounted for them. Yet many were anxious about what seemed to be a somewhat simplistic move from observing what could be taken as evidence of design to the existence of God as creator. Paley's failure to engage Hume's criticisms of natural theology left some of his readers uneasy. For example, Henry Brougham's *Discourse of Natural Theology*

(1835) urged closer attention to the inductive process by which such a conclusion might be reached. Other approaches were set out in the eight *Bridgewater Treatises*, published during the years 1833–1836, which emphasized the importance of interpreting the Bible in the light of new scientific findings, while continuing to insist that belief in God was implicit in the order of nature, and that something of God's nature and character could be ascertained through careful empirical investigation (Topham 2010).

The leading English Catholic theologian John Henry Newman was particularly critical of Paley's approach, arguing that it depended on an essentially mechanical view of the world, which was as likely to lead to atheism as to religious belief (Fletcher 2008). At best, God is seen as a distant object, an 'architect' who might be studied, but who was not an object of worship or adoration. It was, Newman argued, essential to see the natural world as God's creation, and proceed from that starting point. For Newman, there are two ways of 'reading Nature – as a machine and as a work'. The former, Newman insists, evokes human awe; the latter, mere curiosity (Fletcher 2008: 31). Purely rational approaches to nature are inadequate; nature demands a wider range of perceptual faculties to capture its richness and complexity, and articulate its religious significance.

Yet one core assumption of Paley's approach came under increasing scrutiny as the phenomenon of biological evolution became increasingly accepted towards the middle of the nineteenth century. Paley and his immediate successors thought of creation as the establishment of a fixed and invariant biological order through a divine act of creation. Yet the work of the French naturalist Jean-Baptiste Lamarck in the early nineteenth century suggested that some form of development or evolution could be discerned within the biological realm over time. Although Lamarck's proposed explanation of these changes rested on the flawed notion of the transmissibility of acquired characteristics, he secured growing acceptance of the phenomenon of evolution, whatever its mechanism might be. In the end, Charles Darwin was able to offer a better explanation through his hypothesis of 'natural selection'. To use the luminous phrase of Richard Dawkins, the biological order was now seen as the production of a 'blind watchmaker' – the process of natural selection, which is 'blind because it does not see ahead, does not plan consequences, has no purpose in view' (Dawkins 1986: 21). We shall consider this further in the following section.

9 Biological evolution: the challenge of Darwin for natural theology

Paley's theistic explanation of the complexity of the biological order had a significant influence in Victorian England. Indeed, there are good reasons for thinking that Darwin's presentation of his doctrine of 'natural selection' makes use of some of the illustrative and argumentative techniques used earlier by Paley. Darwin's observations of the diversity and distribution of biological species during his five-year round the world trip on H. M. S.

Beagle persuaded him that neither Paley's theory of direct divine creation nor Lamarck's notion of the transmission of acquired characteristics offered satisfactory explanations of the evidence (Ayala 2004).

In their place, Darwin offered the notion of evolution on the basis of 'natural selection' – a hypothesized natural mechanism, which was analogous to the process of 'artificial selection' widely used by livestock and pigeon breeders and horticulturalists to improve the quality of plants and animals. This theory was set out fully in *The Origin of Species* (1859), now widely regarded as one of the most important scientific works of the nineteenth century. Darwin's choice of the term 'natural selection' was unfortunate, in that it seemed to imply that nature actively chose its future forms. As Darwin made clear, particularly in the *Descent of Man* (1871), human beings were also the outcome of a long process of evolution.

Darwin was clear that his understanding of evolution could be accommodated within a religious framework. This aspect of his thought was developed by Charles Kingsley, who argued that Darwin's theory actually clarified the mechanism of creation, in that God delegated a degree of creative agency to the natural world (Kingsley 1874: xxv). Frederick Temple – later to become Archbishop of Canterbury – lent his support to this approach in 1884 (Temple 1885: 115), thus solidifying the support of the English religious establishment for this reading of Darwin.

Yet while Darwin's views on evolution were seen by many as generally consistent with theism, they called into question the core assumptions of the culturally regnant forms of natural theology that tracked back to Paley (McGrath 2011: 143–171; Peterfreund 2012: 109–129). The biological complexity of the natural world might *appear* to be designed; yet this was now to be seen as the outcome of an essentially undirected natural process. The complex biological structures – such as the human eye – that Paley considered to demonstrate 'contrivance' (that is, design and construction by an intelligent agent) were now to be seen as instances of *apparent* design. In reality, they were the results of an undirected process, lacking any form of divine agency or divinely imposed *telos* or goal. It is fair to say that this form of natural theology has never fully recovered from Darwin's naturalist account of biological origins. Thomas H. Huxley remarked in 1869 that what impressed him most on his first reading of Darwin's *Origin of Species* was that it destroyed the credibility of a teleological approach to the natural world (Darwin 1887: 201 [vol. 2]).

Yet Huxley was clear that, while Darwin's notion of natural selection disconfirmed popular notions of teleology, this did not amount to the disconfirmation of the notion of teleology in itself. Darwin's theory of evolution, he argued, bore witness to a 'wider teleology', rooted in the deeper structure of the universe. Why was the universe endowed with certain intrinsic properties that enabled life to emerge and evolve? The importance of this question

became increasingly clear in the twentieth century, as the scientific consensus shifted decisively from an eternal or perennial universe to the theory of cosmic origins that we now know as the ‘Big Bang’.

10 A cosmological revolution: a new context for natural theology

To understand the new interest in natural theology that emerged in the twentieth century, it is necessary to appreciate that the scientific consensus of the first decade of the twentieth century was an infinite, self-perpetuating universe, without beginning or end. Religious ideas of creation were regarded as outdated mythological notions, being completely incompatible with cutting-edge scientific knowledge.

During the 1920s and 1930s, however, growing theoretical interest emerged in the suggestion of an expanding universe (Kragh 2007; Smith 2010). The work of the Jesuit cosmologist George Lemaître and the American astronomer Edwin Hubble both offered strong support for the notion of an expanding universe, and its apparent implication – namely, that the universe had an origin. Two major shifts took place, each with significant implications for natural theology. First, by the 1960s, it was widely accepted that the universe came into being in an event known as the ‘Big Bang’, now estimated to have taken place 13.8 billion years ago. In itself, this development was significant, as it set the discussion of the traditional theological notion of ‘creation’ in a new and intellectually hospitable context.

Yet many would argue that it is the second observation that is the more important – namely, the realization that the universe appears to have been ‘fine-tuned’ (Collins 2009; McGrath 2009). The universe seemed to have come into existence already governed by laws that were fine-tuned to encourage the rise of carbon-based life forms. This point is clearly of importance to natural theology, as well as wider philosophical and theological discussions of the rationality of belief in God as creator. One of the most influential twentieth-century discussions of this point is found in John Barrow and Frank J. Tipler’s *Anthropic Cosmological Principle* (1986), which some consider to be the most important work of natural theology since William Paley. Tipler and Barrow explored several ways of making sense of the apparent ‘fine-tuning’ of the world for biological life – the ‘weak’, ‘strong’, and ‘final’ forms of the anthropic principle.

This evidence of ‘fine-tuning’ has been the subject of considerable discussion among scientists, philosophers and theologians. A constant theme to emerge from this discussion is that the anthropic principle, whether stated in a weak or strong form, is strongly consistent with a theistic perspective. A theist (for example, a Christian) with a firm commitment to a doctrine of creation will find the ‘fine-tuning’ of the universe to be a

retrodictive confirmation of his religious beliefs. This certainly cannot be thought of as a ‘proof’ for the existence of God. It is, however, a further element in a cumulative series of considerations which is at the very least consistent with the existence of a creator God. It gives added ammunition to those who, using the method of ‘inference to the best explanation’ (Lipton 2004), propose that the notion of a creator God possesses greater explanatory fecundity than its rivals.

Unsurprisingly, some of the most important and interesting attempts to reformulate a viable natural theology have engaged with this ‘New Physics’. A good example is the form of natural theology developed by John Polkinghorne during the 1990s, which reflects both his professional expertise in quantum theory, and his later interest in questions of Christian theology. In his essay 'The New Natural Theology' he identified a new interest in questions of natural theology originating from within the scientific community itself.

Yet this revival was linked with a modification of its earlier forms (Polkinghorne 1995: 42). For Polkinghorne, this new approach to natural theology makes no claims to *prove* the existence of God, but rather offers a broader and deeper engagement with the natural world, thus providing a more satisfying account of nature than its secular or materialist alternatives. Polkinghorne thus rejects the idea of natural theology as a freestanding means of demonstrating the existence of God, which challenges claims to explanatory totalization of the natural sciences by offering a richer context for the scientific enterprise, and a deeper engagement with the natural order. His argument is that natural theology rightly belongs within the scope of general theological inquiry, and that it aims to offer enhanced insight into the way the world is by complementing or supplementing the sciences, rather than seeking to displace them.

11 Natural theology: the debates of the twentieth century

Discussion of natural theology during the twentieth century has tended to focus on debates within the philosophy of religion concerning the rationality of belief in God, and whether a theistic account of nature is more satisfactory than its materialist alternatives. Within this community of discourse, ‘natural theology’ tends to be understood exclusively as providing support for, or demonstrations of, belief in God, by setting out from a set of beliefs that are not in themselves religious, and which do not draw on any religious authorities, such as the text of the Bible. More recently, Richard Swinburne developed a ‘ramified’ natural theology, which correlates belief in God with a cluster of other Christian beliefs, such as the doctrine of the incarnation (Swinburne 2004; Holder 2020). In part, this development is to be seen as reflecting dissatisfaction with more generic forms of natural theology, which do not offer the possibility of adjudicating between different forms of theism – such as Christianity and Judaism.

The philosopher Alvin Plantinga has developed an approach to natural theology which, while affirming the rationality of belief in God, focuses particularly on demonstrating the problems with a non-theistic account of the natural world, such as that arising from naturalism or materialism. Plantinga's critique of naturalism complements those offered by philosophers such as Thomas Nagel in his *Mind and Cosmos* (2012). Yet unlike Nagel, Plantinga links his negative evaluation of materialism with his positive evaluation of a theistic account of reality (Sosa 2007; Oppy 2007).

Important concerns were raised about the enterprise of natural theology by the philosopher Martin Heidegger, who considered it to be a discredited 'onto-theology', a preconceived metaphysical system. While such concerns must be recognized, they need to be evaluated carefully. For example, Merald Westphal has suggested that a defective 'onto-theology' can result when the personal God of revelation and worship is displaced by systems of conceptual mastery that strive to be completely self-grounding (Westphal 2001: 1–28). Yet natural theology can be detached from such a context and seen as a legitimate way of seeing and appreciating the natural world from a theistic perspective, without entailing an *a priori* metaphysics.

Natural theology has been the topic of intense discussion and debate within the Protestant theological community during the twentieth century, largely on account of the influence of Karl Barth. Barth's critique of natural theology, understood as the justification of belief in God without depending on the authority of divine revelation, remains both influential and controversial (Molnar 2005; Johnson 2019; Kojonen 2020). Its starting point lies in Barth's intellectual and political disillusionment with early twentieth-century liberal Protestantism, which he saw as being discredited by the destruction and trauma of the First World War. It was necessary to rebuild theology on a more reliable divine foundation, and avoid approaches to theology which, whether intentionally or not, introduced anthropological or cultural elements into a vision of God.

For Barth, natural theology represented an improper attempt by humanity to construct a concept of God under conditions and terms of their own choosing, and thus neutralizing some of the key aspects of a properly theological account of God. Theology is, according to Barth, a response to God's self-revelation in Christ and through Scripture, representing an obedient response to that revelation, rather than an attempt to develop a conception of God based on human experience, culture, or needs. For Barth, such conceptions of God are like Towers of Babel, autonomous human constructions erected in defiance of God (Korsch 2010).

Others, however, have pointed out that this is a criticism directed against one specific understanding of natural theology (an attempt to prove the existence of God and determine the characteristics of God without relying on divine revelation), which does

not adequately engage its other forms which are more thoroughly grounded within the Christian tradition (McGrath 2016: 130–132; Kojonen 2020). Historically, it is also clear that leading writers within Barth's own reformed theological tradition – such as John Calvin – developed forms of natural theology which engaged the order and beauty of the natural world, and the internal 'sense of divinity' known to so many people (Léchot 2018). The 1934 controversy between Emil Brunner and Barth over the relation of 'nature and grace' was partly concerned with the question of whether natural theology was a legitimate option within the Reformed tradition (McGrath 2014: 90–132).

Barth finds support in Stanley Hauerwas's engagement with natural theology (Hauerwas 2002). For Hauerwas, the 'God' that is disclosed through natural theology lacks the depth of a full Christian account of God. In offering this less than 'full doctrine of God', natural theology shows that it cannot serve as a basis for the richer vision of God proclaimed by the Christian church. Yet critics of both Barth and Hauerwas might suggest that their approach fails to note the apologetic role for natural theology – not as a full disclosure of the Christian account of God, but in creating a point of entry from the secular world to this richer vision of God.

Other criticisms of natural theology have emerged from within the Catholic tradition. Michael J. Buckley's account of the origin and development of modern atheism locates its rise in a misjudged religious turn to philosophy and science for its own substantiation, leading to an intellectual overreach which impoverished its rendering of reality (Buckley 1987). Yet others would see this as a cautionary reading of theological history, which points to the vulnerability of certain specific approaches to natural theology, without invalidating the enterprise as a whole. Hans Urs von Balthasar, for example, offers a christological account of natural theology which seems to avoid this particular difficulty (Lösel and Jordan 2002). The palaeontologist Pierre Teilhard de Chardin sought to develop a natural theology that integrated the extended trajectory of evolutionary history with its fulfilment through the New Testament vision of the cosmic Christ (Grumett 2007).

Yet many hold that natural theology has a continuing role in the public articulation and defence of faith, particularly within a scientific culture. The Australian Catholic theologian Neil Ormerod notes that there remains a place for natural theology, even within a scientific culture (Ormerod 2015). What can be verified through the scientific method only represents a partial account of our universe, opening the way to supplementing science with metaphysical and existential reflection. A similar point is made by Polkinghorne, who notes that the natural sciences raise what Karl Popper calls 'ultimate questions' which cannot be answered by the scientific method (Polkinghorne 1995: 43–44). This clearly points to a place for some form of natural theology in engaging, and possibly redirecting, these existential and metaphysical questions.

12 The return to biology: new prospects for natural theology?

In the early nineteenth century, William Paley developed a natural theology that appealed to the complexity of the biological world. In the view of many, Charles Darwin's theory of natural selection called such an approach into question, holding that complex biological structures could emerge over extended periods of time through the process of natural selection. Many in the twentieth century considered that Darwinian theory marked the end of the public plausibility of any natural theology which appealed to the emergence of life in general, or to the complexity of biological life forms. In his *Blind Watchmaker* (1986), Richard Dawkins argued that what was observed in the natural world constituted merely the *appearance* of design.

A number of developments, however, have led to a reconsideration of this view. Three may be noted briefly. The first is the re-emergence of the notion of teleology in biology. Although Darwin's theory of natural selection was initially seen as undermining any possibility of purpose or goal within the biological order, the work of the leading philosopher of biology Ernst Mayr has refocused attention on goal-directed behaviour within the biological world. Mayr was hostile to the imposition of philosophical or theological notions of teleology on natural processes; yet nature itself seemed to have its own intrinsic teleologies, which Mayr believed had to be respected and explored (Mayr 1998: 44–45; cf. Ayala 1970). This point had been hinted at by Thomas H. Huxley, Darwin's leading interpreter in the nineteenth century, who took the view that while Darwin had indeed discredited the teleology of William Paley, the evolutionary process nevertheless disclosed a 'wider teleology'.

This theme was developed by the palaeobiologist Simon Conway Morris, who argued that the evolutionary process seemed to have an inbuilt propensity to navigate its way to certain apparently predetermined solutions (Conway Morris 2003). For Conway Morris the phenomenon of 'convergent evolution' – understood as 'the recurrent tendency of biological organization to arrive at the same solution to a particular need' (Conway Morris 2003: xii) – points to the tendency of the evolutionary process to converge on a relatively small number of possible outcomes. 'The evolutionary routes are many, but the destinations are limited' (Conway Morris 2003: 24). Conway Morris develops a cautious natural theology based on the notion of 'Darwin's Compass', expressing the idea that the created structures of the world make the emergence of life inevitable (Conway Morris 2006).

A second approach builds on the notion of life-friendly cosmic fine tuning, noted earlier (Collins 2009; McGrath 2009). In his *Goldilocks Enigma* (2006), the physicist Paul Davies, for example, pointed out the possible theistic implication of a universe that seemed to be

‘just right’ for life. The growing interest in the phenomenon of ‘biological fine tuning’ has further catalysed interest in the theistic implications of cosmic ordering, and reflection on forms of natural theology that might be grounded in these observations.

A third approach focused on the cognitive capacities and reasoning habits of human beings, rather than the grander cosmic framework within which they are located. The notion that humanity possessed the ‘image of God’ through creation (Gen 1:27) has been discussed by many Christian theologians, and understood in several ways – one of which is that humanity possesses some inbuilt capacity to discern or to relate to God (Middleton 2005). This theological insight has been of particular importance in relation to the Cognitive Science of Religion, a movement which has explored how natural human cognitive processes appear to be predisposed towards religious belief (Barrett 2004). Whereas the ‘New Atheist’ writer Daniel Dennett interprets the apparently ‘natural’ character of religious belief as an argument against its truth (Dennett 2006), Justin Barrett argues that there is no reason to draw such eliminativist conclusions (Barrett 2007). There is clearly potential here for developing a natural theology that is grounded on a divinely-implanted receptivity to the transcendent (De Cruz 2015).

Yet, forms of natural theology that appeal to the biological world cannot avoid considering the wastefulness of the evolutionary process and the massive suffering that it creates. For this reason, some would now speak of a Darwinian ‘natural atheology’ (Lustig 2004). Responses can certainly be made to these concerns (Sollereder 2019). One of the most interesting discussions of the problem of suffering from an evolutionary perspective is due to Christopher Southgate (Southgate 2008), who offers a theological engagement with the problem of suffering in the evolutionary based on the Pauline motif of the ‘groaning of creation’ (Rom 8:22).

The real problem here is the moral and aesthetic ambiguity of the natural world, highlighted by the inefficiency and suffering of the evolutionary process. Does a natural theology focus on the parts of the natural order which appear beautiful and inspiring, or can it enfold the darker side of nature? Some, however, would suggest that this is a decidedly anthropocentric approach to the question, which focuses on human sensitivities. The environmental ethicist Holmes Rolston III argues that while the evolutionary process gives rise to pain and suffering, it also brings into existence new biological forms. ‘The cougar’s fang sharpens the deer’s sight, the deer’s fleet-footedness shapes a more supple lioness’ (Rolston 2008: 111). A non-anthropocentric approach to natural theology helpfully allows a decentring and reframing of these questions.

13 Natural theology: a bridge between science and religion?

One final point needs to be made. Since the publication of Ian Barbour's *Issues in Science and Religion* (1966), the interdisciplinary field of science and religion has attracted growing attention, aiming to forge a better and more productive understanding of the relation of the natural sciences and religious traditions. In the Renaissance, the imaginative framework created by the metaphor of 'God's Two Books' offered a way of depicting their relationship in a way that helped identify their individual strengths. Yet there is a recognition that such a discussion requires 'bridging disciplines' – such as the form of critical realism developed by Barbour himself (Russell 2004), or others that were more attuned to the social and cultural aspects of both science and religion.

Natural theology might be one such bridging discipline, in that it is explicitly concerned with proposing and exploring possible conceptual links between the natural world, investigated by science, and a transcendent world of religion. The emergence of 'physico-theology' in the seventeenth century is of particular importance in this respect, as it represented an intellectual and cultural bridge that was constructed between the religious and scientific worlds, at a time when it seemed to some that a permanent gap might open up between them. Natural theology was able to affirm the importance of religion in an increasingly scientific age, just as it also affirmed the importance of the natural sciences for a persistently religious age (Gaukroger 2005).

The revival of the medieval Islamic kalām argument for the existence of God should be noted here. As scientific evidence for the universe having an origin – rather than being eternal – began to accumulate during the twentieth century, philosophers such as William Lane Craig began to reappropriate and develop the kalām cosmological argument, which has become perhaps the most discussed philosophical argument for God's existence in recent decades (Pedersen and Lilley 2014; Copan and Craig 2018). This argument holds that a series of past events cannot be infinite. If past events are finite, it can be argued that the universe is not eternal, but had an origin. Since the universe could not have come into being uncaused, there must therefore be a transcendent cause of the origin of the universe. As Craig points out (Craig 1979: 149–153), this argument resonates with both contemporary cosmology and theism.

John Polkinghorne is one of many writers to bring out the important role of natural theology in enriching a purely scientific account of our world. For Polkinghorne, natural theology supplements the natural sciences, rather than presenting itself as a rival or competitor in the matter of scientific explanation. Polkinghorne's point is that science does not need any theological supplementation within its own distinctive domain of competence, it nevertheless raises questions which it cannot answer on the basis of its own working methods (Polkinghorne 1995: 43). For example, Polkinghorne points to the rational transparency of the physical universe; why, he asks, are we able to make so much sense of our world? Polkinghorne thus presents natural theology as a conversation partner

between theology and the natural sciences, enabling each to capture a richer vision of reality than either could achieve individually. Natural theology thus offers an enhanced insight into the way the world is by complementing or supplementing the sciences, rather than seeking to displace or contradict them.

Polkinghorne offers us one way of understanding the way in which natural theology can help bridge the disciplinary gap between the sciences and religion. Others, of course, can be offered to supplement it. However, it is clear that natural theology is well placed to play this bridging role in this increasingly important intellectual and cultural dialogue.

Earlier, we noted that Holmes Rolston's engagement with environmental ethics shows a clear interest in issues associated with natural theology, not least the problem of distinguishing between ecological 'facts' and environmental ethical 'values' (Rolston 1989: 20). The former cannot generate the latter without the assistance of a bridging discipline. Yet as the philosopher of religion Mark Wynn points out, a natural theology can play an important role in discussing the nature of the goodness of the natural order, and identify the reasons why we may fail to register its goodness fully – and hence act appropriately (Wynn 1999). The rediscovery of eco-theology draws on many roots (Pihkala 2016); the field of natural theology is certainly one of these (Hamlin 2018). In the light of the challenges to nature faced in the twenty-first century, the renewal of a natural theology might well contribute significantly to the elaboration of a non-anthropocentric view of nature, which does not locate the value of nature simply in its utility. Science may help in this quest; yet the future of environmentalism depends on valuing nature on grounds that ultimately lie beyond the scope of the scientific method. As Albert Einstein once commented, 'the scientific method can teach us 'nothing beyond how facts are related to, and conditioned by, each other. […] The knowledge of what is does not open the door directly to what should be' (Einstein 1954: 41–42).

In reviewing the shifts in fortunes of the notion of natural theology within the field of science and religion, Peter Barrett has noted the wider relevance and significance of a scientifically-engaged natural theology, especially in relation to expanding these emerging understandings of natural theology into a 'well-grounded, epistemologically coherent natural theology' (Barrett 2010: 443). Perhaps there is some considerable way to go in this matter; nevertheless, Barrett's assessment of the direction of travel reminds us of the ongoing importance of natural theology across the spectrum of human intellectual concerns.

14 Conclusion

So, what is the future of natural theology? For Karl Barth, it was an unnecessary and improper enterprise, rendered redundant by divine self-disclosure. For Richard Dawkins, it was an improper and pointless exercise, rendered redundant and implausible by

Darwinian evolutionary theory. Others, however, argue that natural theology may have a bright future ahead of it. The contemporary retrieval of Aquinas's natural theology (White 2016) is an important indication of the utility and value of classical approaches to its themes. The recognition of the involvement of multiple human perceptual processes in natural theology has moved the discipline far beyond the shallow rationalism of earlier formulations, such as that of William Paley.

As David Pickering suggests, natural theology might well find a future 'expanded role in a globalized world in which there is no single "Public Square" and there is no "view from nowhere"' (Pickering 2021: 355). While some see natural theology's independence from revelation as diminishing its appeal, Pickering points out that, since it 'claims no authority and demands no privileges', it might well serve as a 'particularly suitable medium for discussions between ideologies, philosophies, and theologies' (Pickering 2021: 355). We certainly need such a conceptual space for this discussion in an increasingly fragmented world of thought and belief.

Attributions

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