Essays in Honor of Alister McGrath

with Bethany Sollereder, "Introduction to Essays in Honor of Alister McGrath"; Peter Harrison, "What is Natural Theology? (And Should We Dispense with It?)"; John Hedley Brooke, "Revisiting William Paley"; Helen De Cruz, "A Taste for the Infinite: What Philosophy of Biology Can Tell Us about Religious Belief"; Michael Ruse, "The Dawkins Challenge"; Donovan O. Schaefer, "The Territories of Thinking and Feeling: Rethinking Religion, Science, and Reason with Alister McGrath"; Andrew Pinsent, "Alister McGrath and Education in Science and Religion"; Andrew Davison, "Science and Specificity: Interdisciplinary Teaching between Theology, Religion, and the Natural Sciences"; Victoria Lorrimar, "Does an Inkling Belong in Science and Religion? Human Consciousness, Epistemology, and the Imagination"; and Alister E. McGrath, "Response: Science and Religion—The State of the Art."

REVISITING WILLIAM PALEY

by John Hedley Brooke

Abstract. Evaluations of William Paley's *Natural Theology* (1802) routinely refer to its philosophical and theological shortcomings, especially its vulnerability to Charles Darwin's scientific naturalism. Nevertheless, Paley still repays a visit as a subject who transcends common stereotypes, four of which invite correction: that Paley wrote in culpable neglect of David Hume; that he pretended to give a deductive demonstration of God's existence; that by making his *Natural Theology* a stand-alone book, his apologetic framework was neglectful of revelation and therefore inconsequential for Christian theology; and that, preoccupied with the minutiae of anatomical specificity, he was blind to laws connecting natural phenomena. Nuances in Paley's thinking, particularly his allowance for the extension of scientific naturalism, help to explain the sympathetic recognition he still enjoyed among scientific figures until the end of the nineteenth century. For Thomas Huxley, he had even created a metaphysical space that allowed for a science of evolution.

Keywords: Argument from design; creation; Darwin; evolution; David Hume; laws of nature; natural selection; natural theology; naturalism; philosophic theology

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It gives me great pleasure to acknowledge that this article owes a special debt to Alister McGrath because it had its preliminary iteration at an Oxford conference, held in June 2008, which he had organized. The

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conference addressed the diversification of natural theology in nineteenth-century Britain and the respects in which, as a genre, it advanced beyond William Paley's classic *Natural Theology* of 1802. Because Paley has so often been caricatured, I resolved to give him a fairer hearing than he routinely enjoys as the archetypal, hapless exponent of the argument from design, doomed to extinction by Darwin. In this revised and amplified version of that paper, I return to Paley's apologia, recognizing that he continues to be revisited, notably by McGrath himself, in accounts that better contextualize and capture the nuances of his thought (McGrath 2011, 2016). Selective quotation from Paley's *Natural Theology* (1802) can make him a figure of fun; but more sympathetic readings are also possible. Page references inserted in the following account are to the Oxford World's Classics Edition (2006) of his *Natural Theology* (1802), edited with an introduction and notes by Matthew Eddy and David Knight.

Paley and The Ease of Caricature

It is undeniable that many of Paley's remarks invite caricature. In his concluding chapter, he famously constructed an argument for a caring Providence from the wings of an earwig: "The hinges in the wings of an *earwig*, and the joints of its antennae, are as highly wrought, as if the Creator had nothing else to finish. We see no signs of diminution of care by multiplicity of object, or of distraction of thought by variety. We have no reason to fear, therefore, our being forgotten, or overlooked, or neglected" (280).

In this happy situation, Paley was no stranger to pain and suffering, both personally and in his Christian ministry. He composed a "Clergyman's Companion in Visiting the Sick" with carefully chosen prayers according to the type and degree of a person's affliction, its prognosis and progress (Paley 1828, 235–335). Yet Paley's world was a "happy world," one in which multiple marks of pleasure were detectable in the book of nature. In the exuberance of his affirmation, he would expose himself to raised eyebrows. He would imagine the gratification experienced by aphids when feeding; luxuriate in the murmur and vitality of flying insects on a summer night; he would celebrate a created order in which the fry of young fish are "so happy, that they know not what to do with themselves" (238). It is easy to reduce his natural theology to the projection of a vicarage garden onto nature. It is easy to smile when we read that the human epiglottis is so exquisitely designed that at city feasts "not two guests are choked in a century" (97). Easy to smile again when we learn that the goodness of God is proved by the fact that food tastes more delicious than is necessary for the provision of sustenance (251).

Paley has, moreover, suffered from critics who have depicted his *Natural Theology* as a derivative work, lacking the sparkle and originality characteristic of earlier essays in the genre. For Charles Raven, Paley's depiction

of nature paled into insignificance when compared with the observational genius of John Ray in his *The Wisdom of God Manifested in the Works of Creation* (Raven 1942, 1953). This was severe, not least because, as McGrath has observed, there was originality in Paley's introduction of technological imagery into his rhetoric for design in nature (Gillespie 1990; McGrath 2016, 240–43). Yet Paley has suffered, too, from philosophers who chastise him for using arguments already discredited by Hume. Overriding both the historical and philosophical critiques, he has suffered from the paradigm shift that took place when Darwin showed how nature could simulate design through the perfecting process of natural selection. As Darwin himself put it: "The old argument of design in nature, as given by Paley, which formerly seemed to me so conclusive, fails, now that the law of natural selection has been discovered" (Darwin 1958, 87).

I have deliberately used the term "paradigm shift" because the switch from the worldview of Paley to seeing the world through Darwin's eyes can have the character of a gestalt switch or conversion experience. After reading the papers of Darwin and Alfred Russel Wallace presented to the Linnaean Society in 1858, the naturalist Alfred Newton declared that "I went to bed satisfied that a solution had been found…it came to me like the direct revelation of a higher power; and I awoke next morning with the consciousness that there was an end of all the mystery in the simple phrase, 'Natural Selection'" (Cohen 1985, 595). The appearance of design in the contrivances of nature could now be explained without Paley's Contriver. Moreover, the somewhat tedious practice of accumulating example after example of design, on Paley's supposition that the strength of the argument was cumulative, was undermined.

Given these considerations, the prospects for a reprieve for Paley must surely be slim. Even among early-nineteenth-century thinkers he became a target for medical reformers and other political radicals eager to pillory Oxford, Cambridge, and the Anglican Establishment (Desmond 1989, 152–92; Eddy and Knight 2006, xxv). Other critics called into question the religious efficacy of rational proofs: make a man feel the *need* of Christianity was Coleridge's well-known protest. Among modern commentators, including McGrath, who resuscitate natural theology by subsuming it under prior theological presuppositions, the distancing from Paley is marked and explicit. For McGrath, there is little prospect of a viable natural theology unless it is already framed and informed by Trinitarian Christianity, for which it may then provide reinforcement (McGrath 2011; Kojonen 2017, 2020).

I shall argue in this article that Paley still repays a visit as a subject who transcends the stereotypes frequently applied to him. Four caricatures particularly invite correction: that Paley wrote in culpable neglect of Hume; that he presented his "proof" as if it were a deductive demonstration of Gods' existence; that by making his *Natural Theology* a stand-alone

book, he implied the genre was independent of revelation and therefore of little consequence for Christian theology; and that Paley was so preoccupied with the minutiae of anatomical specificity that he was blind to the laws connecting natural phenomena. The latter sections of the article will introduce several nuances in Paley's thinking that help to explain the sympathetic recognition he continued to enjoy, even in the scientific community, until the end of the nineteenth century.

Paley and Hume

Because Paley's presentation of the design argument often serves to introduce the greater philosophical acuity of Hume's skeptical critique, many are the uninitiated who have assumed that Paley preceded Hume, or that, if he succeeded him, he must have been philosophically negligent. In reality, although he may not have addressed all Hume's skeptical arguments, he certainly addressed some. A Humean interlocutor can be discerned in his text; and far from ignoring his predecessor, Paley turned Hume's analysis of causality to advantage (McGrath 2016, 244, 248). Three examples of Paley's critical response deserve comment:

In his posthumous *Dialogues Concerning Natural Religion* (1779), Hume had contested the inference to a Designer on several grounds, one of which was that a "principle of order" might simply be inherent in nature itself. To this Paley had an explicit rejoinder: "A principle of order is the word: but what is meant by a principle of order, as different from an intelligent Creator, has not been explained either by definition or example" (42). Hume had merely substituted words for reasons, names for causes. By "order" Paley understood "only the adaptation of means to an end." Consequently, a principle of order could "only signify the mind and intention which so adapts them" (42). To Hume's suggestion that living systems could have arisen by unconscious generation, Paley replied that, in this case, the word "generation" describes a process that is itself problematic in a universe not guided by a cosmic intelligence (Ferré 1963, xxv). Moreover, if there were an inherent principle of order, one would expect the order to be realized universally, whereas it is found discriminately—in eyes, for example, but not in rocks and mountains (43). Order is found where needed, not where it would be useless. This may not be an adequate riposte, but it is a riposte.

A second example relates to an objection older than Hume, but one that Hume had modified for his purposes. This was the Epicurean argument that nature might have experimented with every possible combination of limbs and organs, only the viable surviving—thereby creating the illusion of design in the adaptations we see today. Hume had been less prodigal with nature's products, but his logic was not dissimilar: "It is in vain, therefore, to insist upon the uses of the parts in animals or vegetables

and their curious adjustment to each other. I would fain know how an animal could subsist unless its parts were so adjusted?" (Hume 1963 [1779], 158). True, Paley read design into the mutual adjustment of parts, but he had rejoinders to Epicurean skepticism. He insisted that there was no evidence of nature's experimentation occurring now. Moreover, "multitudes of conformations, both of vegetables and animals, may be conceived capable of existence and succession, which yet do not exist" (39). On the Epicurean argument, the real surprise is that we do not see mermaids, unicorns and centaurs. If all possible existences had been tried, why were there no humanoids around without fingernails, or with fewer fingers and toes? This is a pre-Darwinian imagination, to be sure, but it is an explicit engagement with a skeptical argument.

My third example relates to Hume's principle that, when drawing causal inferences, the cause must always be proportioned to the effect it ostensibly causes. The immediate consequence of applying this principle was that, from finite effects in a finite world, it was inadmissible to infer a deity with infinite power. Claims for an omnipotent deity based on appeals to design were therefore doomed. Was Paley oblivious to this problem? Not so, according to Ferré who, enlisting the following passage, observed that there is moderation in what Paley meant by "omnipotent" (Ferré 1963, xix): "A power which could create such a world as this is must be, beyond all comparison, greater than any which we experience in ourselves, than any which we observe in other visible agents, greater also than any which we can want, for our individual protection and preservation, in the Being upon whom we depend" (231). A greater power, but not necessarily infinitely great. Paley was not claiming proof of an infinite power. Similarly, "omniscience" for Paley stood for very great wisdom, surpassing "all idea we have of wisdom, drawn from the highest intellectual operations of the highest class of intelligent Beings with whom we are acquainted". It was a degree of wisdom adequate to the conduct of the natural order. "And this," he added, "is enough" (231).

Paley and Proof

Did Paley present his design argument as a deductive proof in which the existence of God was logically entailed by his reasoning? This has been a common accusation, especially favored by contemporary theologians wishing to spotlight the greater modesty of their own natural theologies. To inflate what Paley claimed for his analogies between organisms and machines can be a convenient way of commending natural theologies that do not pretend to provide demonstrable proof (Polkinghorne 1998; McGrath 2011, 117, 280). The problem is that, although the word "proof" *was* often used in the tradition that Paley represents, it was rarely used in a deductive, Euclidean sense. The design argument was far more frequently under-

stood to generate probabilities rather than certainties. Paley's predecessor Joseph Butler had made a special point of differentiating the probable from the logically demonstrable. Where probable evidence is involved, Butler wrote, "it admits of degrees; and all variety of them, from the highest moral certainty to the very lowest presumption" (Eddy and Knight 2006, xx). But this was not a problem because, in all practical matters, probability was the "very guide to life" (Butler 1961 [1736], 2). When reflecting on the goodness of the Creator, and this earthly life as a period of probation, Paley had in mind the *compatibility* between the appearance of design in the contrivances of nature and the "supposition of design on the part of the Deity" (271). The discourse was not one of proof: it was "enough" that the appearances and the supposition were "reconcilable" (271). Paley believed that a state of probation for humankind is part of the divine design. But his rhetoric refers to probability, not deductive proof: "we assert the most probable supposition to be, that [we live in] a state of moral probation" (271).

Even when Paley came closest to claiming that the existence of God was entailed by his proofs, there would still be a note of equivocation. After extolling the fine adjustments involved in the mechanics of muscular action, he did say that here was "nothing short perhaps of logical proofs of design" (81). However, as Eddy and Knight observe in their Oxford edition of *Natural Theology*, one must not overlook the crucial word "perhaps" (307, note 81). We should not commit him to claims for entailment. According to Ferré, "Paley (like the scientist) claims not to provide absolute deductive logical necessity for his conclusions … but rather to offer inductively reasonable grounds for belief in his assertions – grounds sufficient for complete rational conviction. Paley is aiming, therefore, at building as strong a *probable* case as possible; he will be content if he can show that it would be arbitrary and unreasonable – though not necessarily self-contradictory – to reject it" (Ferré 1963, xiv). Likewise, McGrath insists that by a "proof" of the existence of God, Paley never meant a logical proof, "but rather a rhetorical demonstration, similar to that then encountered in a court of law" (McGrath 2011, 117). We are told by an early biographer that, even during his school days, the young Paley had been so mesmerized by a visit to the assizes in Lancaster, that he had assumed "the dignity of a venerable judge" and "had his playmates arraigned before his mimic tribunal" (Paley 1828, 2). He would retain that keen interest in courts of law and their practices, though, as McGrath observes, it was Paley's misfortune that, during the first half of the nineteenth century, the criteria for what constituted compelling evidence became more stringent in courts of law as well as in the interpretation of nature.

Paley and the Christian Revelation

It is commonly said that, by making his *Natural Theology* a stand-alone book, Paley reduced the genre to an exercise independent of revelation and therefore of little or no consequence for Christian theology. The issue here is complex. Before Paley, arguments drawn from natural theology were sometimes commended precisely because they did purport to be independent of revelation. They could be seen as giving additional, unbiased support to claims for a wise and powerful Deity. To downplay biblical references could even be justified as a deliberate strategy designed to avoid the unnecessary repulsion of atheists in one's readership (Calloway 2014, 36–37). There were, however, problems if one stressed the independence. One could easily encourage the deists who were happy to dispense with revelation altogether or to do so wherever its tenets failed to pass the test of reason. Another complication had been identified by Hume. Inferences from nature to the attributes of God might pretend to stand alone; but, in reality, their proponents were presupposing the very attributes they wished to establish. All Hume allowed design arguments to deliver was that there might be a designer bearing some remote resemblance to human intelligence. If one claimed, as Paley certainly did, that the designer had attributes of a Christian God, these, from a Humean perspective, were being smuggled surreptitiously into the argument.

Paley was certainly criticized for deistic tendencies and was maligned as a closet Unitarian. In sermons as early as April 1832, long before his conversion from the Anglican Church to Roman Catholicism, John Henry Newman was already dismissing natural theologies of the Paley type for their "false cheerfulness," irrelevance to the fundamental doctrines of Christianity, and especially to the primacy of an educated conscience in the Christian life (Turner 2002, 140). When, 40 years later, many of Newman's lectures and publications were consolidated in a single volume, *The Idea of a University* (1873), his critique revolved around an issue that has frequently recurred when a conservative understanding of divine Providence confronts a conception of "order" simply premised on *laws* of nature that seemingly bypass more fundamental questions about the moral governance of the universe (McGrath 2011, 127–30). Newman's objection was that this was a genre of natural theology that tended to dispose the mind *against* Christianity. It did so by discouraging contemplation of the suspension of natural laws in miraculous events, which Newman considered essential to the idea of Revelation. He had preferred to place his trust in "intuitive spiritual perception" rather than in inferences from the natural order (Turner 2002, 329).

Newman diagnosed the dangers of a rationalist apologia from the standpoint of a strong Christian theism in which Revelation was paramount. It is, however, a question whether Paley entirely deserved the rebuke.

Contrary to the caricature, Paley did not see his *Natural Theology* as a stand-alone work. It was one of three substantial texts that he saw as interrelated. In *The Principles of Moral and Political Philosophy* (1785), he had articulated his utilitarian ethics. In the second, his *Evidences of Christianity* (1794), he had defended the gospels as an authentic revelation. This had required a chapter in which he explicitly responded to Hume's attack on reported miracles. *Natural Theology* was published last. In his dedication of the book to Shute Barrington, Bishop of Durham, Paley said that he had offered the public "the evidences of natural religion, the evidences of revealed religion, and an account of the duties that result from both." And then the revealing statement: "they have been published in an order, the very reverse of that in which they ought to be read" (4). What Paley hoped to accomplish with his *Natural Theology* was the encouragement of belief in the existence of a deity whose attributes were such that it would be reasonable to expect a revelation of greater theological significance than that to be found in nature alone: "It is a step to have it proved, that there must be something in the world more than what we see. It is a further step to know, that amongst the invisible things of nature, there must be an intelligent mind, concerned in its production, order, and support. These points being assured to us by Natural Theology, we may well leave to Revelation the disclosure of many particulars, which our researches cannot reach" (280).

An example he gave was of the resurrection of the dead. It surely made the belief more credible if one were already persuaded of a God with the power and moral governance to effect the dispensation (281). Paley would have been surprised by Newman's depiction of natural theology as corrosive of belief in revelation. From his standpoint, the primary purpose of his book was to *facilitate* "the belief of the fundamental articles of *Revelation*" (280). Nor would he have considered himself deserving of the criticism leveled by Coleridge at the rationalism of natural theology, notably its failure to make readers feel the need of Christianity. In a sermon entitled "All Stand in Need of a Redeemer," Paley delivered what Coleridge wanted. He dwelled on feelings of deficiency and imperfection experienced in many different endeavors and especially by those sincerely seeking salvation (Paley 1815, 284–96). There is no evidence that Paley was hoping to reduce religion to the compass of his *Natural Theology* (Ferré 1963, xxvii).

Nor did Paley's understanding of Providence exclude God's special interference in the world, which might—designedly—be imperceptible to us: "It is by no means incredible, that his Providence, which always rests upon final good, may have made a *reserve* with respect to the manifestation of his interference, a part of the very plan which he has appointed for our terrestrial existence" (270). In John Beatty's paraphrase, "God hides his special providences in apparently unpredictable phenomena" (Beatty 2020). This was no deistic destruction of immanent divine action. One

finds a similar move today among those who theologize about the openness and unpredictability of events in the quantum world. Paley believed that his natural theology, far from irrelevant to the conduct of a Christian life, was conducive to seeing the world as a temple, enabling one's life to be "one continued act of adoration". Critically, "whereas formerly God was seldom in our thoughts, we can now scarcely look upon anything without perceiving its relation to him" (279).

Paley and the Laws of Nature

Here the charge leveled against Paley is that he was so preoccupied with the minutiae of anatomical particularity that he was blind to the laws connecting natural phenomena. Given Newman's objection that the natural theology epitomized by Paley was too preoccupied with physical laws to pay attention to the miraculous, there is irony in the fact that another caricature invests him with preoccupations that diverted his attention from laws of nature. There is an element of truth in the characterization. Paley *is* drawn to specificity. Not only does he marvel at peculiar provisions, such as the hook on a bat's wing; he also goes to town on the specifics of what he called "compensation." Consider the parrot's hooked beak. Paley is fascinated by it because the hook enables the parrot to climb and to break nuts. But he is even more fascinated by the way in which nature compensates for an associated inconvenience: "The upper bill of the parrot is so much hooked, and so much overlaps the lower, that, if, as in other birds, the lower chap alone had motion, the bird could scarcely gape wide enough to receive its food" (148). And yet, in the parrot the upper chap is moveable as well as the lower. Such attention to specificity is part of Paley's charm. He had a way of making natural history enthralling and he succeeded with the young Darwin.

The question, though, is whether his enthusiasm for the great diversity of contrivance prevented him from achieving any unified system of nature. Compared with Darwin, manifestly not. Paley did reflect on the unity of nature and its internal connections when seeking to establish the unity of the Deity. This was also one of the contexts in which he did refer to *laws* of nature and in a manner often repeated by apologists later in the nineteenth century. His aphorism that "a law presupposes an agent" (9) would be repeated by William Whewell, among many others, who inspected nature for indications of their Creator (Brooke 1991, 151).

Nature for Paley was not just a composite of separate artifacts. There was a uniformity of plan from which the unity of God could be inferred. The universe, in short, was a "system; each part either depending upon other parts, or being connected with other parts by some common law of motion, or by the presence of some common substance" (234). In this respect, Newtonian science was an attractive resource: "One principle of

gravitation causes a stone to drop towards the earth, and the moon to wheel around it. One law of attraction carries all the different planets about the sun" (234). Paley certainly preferred anatomical to astronomical arguments, but the theme of unity in nature found expression there as well. Large terrestrial animals had a similar skeletal structure. "Digestion, nutrition, circulation, secretion, go on, in a similar manner in all" (235). He even took the unification too far, claiming that "the experiment of transfusion proves, that the blood of one animal will serve for another" (235). Even in fish, we find stomach, liver, spine, and eyes only slightly varied from our own; and that very variation he describes as a continuance of the "same exquisite plan." The similitude "bespeaks the same creation and the same Creator" (235).

This may not be sophisticated science; but it is important for two reasons. First, during the nineteenth century, philosophies of biology were advanced in which explanations based on unity of type were set up in opposition to explanations based on function and design. This approach emanated, as with so many secularizing moves, from France, from Geoffroy St. Hilaire (Brooke 1989a). Undoubtedly there was scope for this oppositional stance. Were male nipples really designed for a purpose? Were they not rather an indicator of a more general template? This emphasis on pattern, rather than purpose, was certainly used to embarrass the teleology of Paley at its simplest. Yet, British anatomists and paleontologists, preeminently Richard Owen, were able to integrate the two. Design was discernible in the adaptation of a common skeletal archetype to the particular needs of particular species (Rupke 1994, 196–97). I agree with McGrath that Owen advanced beyond Paley (McGrath 2011, 112). However, an identity of plan, modified to meet specific needs, is a trope already used by Paley.

A second reason why Paley's commitment to the unity and to the laws of nature deserves attention has to do with Darwin. In a penetrating study of Darwin's intellectual development, Kohn argued that Darwin did not set out to destroy natural theology but to reform it (Kohn 1989). The nature of the reform had already been presaged by the astronomer John Herschel. The idea was seductively simple: design should not be sought in the particularities of things but in the laws governing the universe that made such particularities possible. Here it is tempting to set up an antithesis between Paley's love of special contrivances and the quest for laws underlying the patterns in both physical and organic nature. The adaptations at which Paley marveled were eventually subsumed by what Darwin called the "law of natural selection." Yet, the engaging point is that, in 1859 and beyond, Darwin would speak of "designed laws" (Brooke 2009). He did not, as founders of the "intelligent design" (ID) movement do, assert that if a phenomenon can be explained by law, it cannot be used to infer design (Dembski 1998). In his correspondence with Asa Gray, Darwin said that

he was inclined to see the world as the result of designed laws, with the details left to chance, despite that formula leaving him dissatisfied (Darwin 1860).

There was much in Darwin that superseded Paley, in his science and in his philosophy of nature. Interestingly, however, the nomological form of the design argument had been there in Paley too. In his astronomical chapter, there was a fine-tuning argument designed to show that Newton's law of gravitation lay within a very narrow range of possible formulations that could deliver a viable system. Moreover, within the narrow range the best possible had been chosen (207). As with Newton himself, Paley saw in the laws of nature the result of choice not chance. He spoke of the deity *appointing* laws to matter (204); Darwin would speak of the Creator *impressing* laws on matter (Brooke 2009). For Paley, the natural world was governed by divine legislation and one could say the same for Darwin at the time he wrote *On the Origin of Species* (1859). In his large, unpublished species book, of which the *Origin* was a hastily written summary, Darwin was still linking discourse about nature to discourse about God: "By nature, I mean the laws ordained by God to govern the universe" (Richards 2009, 61).

Science and the Extinction of Paley?

That Darwin still had the deity legislating for the universe late in the development of his theory invites a broader perspective on the fate of Paley's book. Was his natural theology simply annihilated by advances in the historical sciences? On one level, yes. Remarkable discoveries in the earth and life sciences embarrassed some of the basic tenets of his worldview. Paley wrote before geology was revealing what Martin Rudwick has called scenes from deep time—scenes long before humans had appeared and during which countless species had become extinct (Rudwick 1992, 2005). Paley wrote when it was still possible to say that "Nature's species never fail" (249). He wrote before Georges Cuvier established the extinction of giant quadrupeds, before the Genesis flood subsided as an explanation for the fossil record, and before Charles Lyell eliminated the geological catastrophes that had been suggestive of a God active in nature. Paley wrote before Darwin emancipated himself from the concept of "perfect adaptation," replacing it with competition between forms and their variants that were differentially adapted to the conditions of their existence (Ospovat 1981). At the very least, under such pressures, natural theology would have to diversify (Brooke 1994; Brooke and Cantor 1998; Topham 2010, 96–113; McGrath 2011, 108–42).

There is, however, more to the story than meets the untutored eye. One of the reasons why a discourse of natural theology flourished in Britain during the nineteenth century was that it could be used in the

justification and popularization of science. It helped to avert religious suspicion if one could show that, far from threatening religious belief, the sciences actually lent support (Brooke 1997; Fyfe 2002). It was spiritually edifying to contemplate the wisdom of the Creator. Because there was frequent appeal to knowledge of nature in Paley's text, and in succeeding works such as the eight *Bridgewater Treatises* of the 1830s, they could be valued as a politically safe form of science popularization even while questionable as a Christian apologia (Brooke and Cantor 1998, 153–61; Topham 1998, 2010, 2022; Fyfe 2002). Indeed, Paley's book "came to the rescue of science teaching in Oxford" when it badly needed a lift (Fyfe 2002, 739, 745). Given that its science content was updated by its later editors, *Natural Theology* was to prove a remarkably successful vehicle for the communication of scientific knowledge, increasingly so as the specialized writing of scientists became more challenging for lay people. As it passed through the hands of successive editors and publishers, it was kept "relevant to readers throughout the nineteenth century" and thus became a classic (Fyfe 2002, 731).

For the diversification of nineteenth-century natural theologies informed by scientific development, one could point to Whewell's shift in focus from Paley's anatomical designs to the design of the human mind itself, for which the fact that science was possible at all provided the most compelling evidence (Yeo 1979; Snyder 2006, 92). Or to Oxford's William Buckland popularizing a paleontological model in which a concept of progressive creation ("the fitness of the world for animal life appears to have been progressive") purportedly took the sting out of species extinction (Rupke 1983, 159). Or to Buckland's opposite number in Cambridge, Adam Sedgwick, finding in the successive appearance of new forms in the fossil record a means to silence the atheistic argument that the forms of living things were eternal and uncreated (Brooke 1997, 54). Or to arguably the most prolific popularizer of geology, the Scottish evangelical Hugh Miller, who celebrated the beauty of fossil forms, the ammonite providing a striking example. Structures embodied in organic nature reminded Miller of human architecture, of the buttresses and vaults of Gothic cathedrals. The fact that architectural structures that human beings find beautiful were long ago presaged in the rocks testified to a shared aesthetic sensibility in humans and their Creator (Miller 1857; Brooke 1996, 176–85).

The association of natural theology with the promulgation of science was not stopped by Darwin. He, after all, was grateful to his chief popularizer in North America, Asa Gray, who engaged in a discourse of natural theology as he sought to quell the religious anxiety of his Presbyterian compatriots. Importantly, Gray's defense of natural selection incorporated the claim that Darwin's science not merely cohered with natural theology but positively enriched it. The theologians' age-old problem of theodicy could

perhaps be mitigated if the struggle for existence in Darwin's evolutionary mechanism were a *sine qua non* of the possibility of a creative process capable of engendering intelligent life (Gray 1963, 293–320)—an argument still deployed theologically today (Southgate 2008, 2018; Russell 2018).

During the second half of the nineteenth century, innovations in the physical sciences continued to appear that suggested the propriety, not the obsolescence, of motifs in Paley, such as his argument from the unity of nature to the unity of God. In a paper presented to the Metaphysical Society in July 1869, Unitarian physiologist and philosopher William Carpenter enlisted recent knowledge of the correlation and interconvertibility of physical forces to affirm the culmination of "man's intellectual interpretation of nature …[in] his recognition of the Unity of the Power, of which her phenomena are the diversified manifestations" (Carpenter [1869] 2015, 55). A few years later, another Unitarian intellectual, James Martineau, was invoking Darwinian natural selection in the *defense* of teleology: "The very phrase, indeed, by which the establishment of species for survival is described, - 'Natural Selection', - admits that Nature does the same thing that human Art effects" (Martineau 1877, 78). Darwin's analogy between natural and artificial *selection* had arguably widened, rather than closed, the door on intentionality in nature.

The Redemption of Paley?

The question has arisen in contemporary discussion of natural theology whether Paley's assimilation of the biological world to a temple might yet be redeemed, despite the innumerable critiques to which it has been exposed. Erkki Kojonen, for example, asks whether Plantinga's "design discourse," might contribute to such a redemption with its emphasis on the perception of divine purpose in biology as essentially intuitive, its rational defense requiring only the refutation of objections (Plantinga 2011; Kojonen 2018, ch. 8). Within the current ID movement, Paley is not short of admirers and Kojonen notes that Plantinga's program appropriates arguments from ID rhetoric. His contrary proposal is that it does not have to. Despite familiar objections based on the extent of "natural evil" in the world, and on the alleged sufficiency of natural selection to account for the appearance of design in living systems, Kojonen suggests that Plantinga's conception of "design discourse" could be used profitably by proponents of theistic evolution.

It has not been my intention to attempt anything so grandiose as the redemption of Paley, whose worldview, so foreign to our own, presupposed a natural world constituted by and occupied by fixtures, by species without a history. I have, however, been suggesting that if Paley is dismissed too lightly, if he is simply reduced to a cipher, to a textbook exemplar of the

design argument, to a whipping boy for Darwinian polemicists, important nuances will be lost. With two of these I shall close. One concerns the threat to natural theology from the role of randomness in Darwin's understanding of evolution. The second concerns the ease with which the generosity of Paley's naturalism facilitated the instantiation of methodological naturalism as a defining feature of modern scientific culture.

In discussions of Darwinism and religion, much is made of the seeming contradiction between chance and design (Ruse 2003; Johnson 2015; Harrison 2016). While Paley was drawn theologically to the exclusion of chance from the origin and disposition of nature, Darwin insisted on randomness in the appearance and distribution of the variations on which natural selection worked. McGrath is surely correct in saying that there is no suggestion in Paley that chance might be a catalyst for the emergence of higher levels of order (McGrath 2016, 249). Yet the role of "chance," according to Curtis Johnson, was so central to Darwin's theory that, when he fully realized how offensive its connotations could be to his readership, he started to modify his language in ways calculated to preserve its centrality while making it appear innocuous. By the fourth edition of the *Origin*, he was describing naturally occurring variations not as "chance" but as "spontaneous." By the early 1870s, his references to chance had all but disappeared (Johnson 2015, xvii, 209).

Neither Paley nor Darwin would have accepted that "chance" events are events without a cause. For Paley, the word applied to the operation of causes without design. Darwin recognized that use of the word might simply conceal an ignorance of the cause. Or, as with Paley also, it might refer to an event arising from the intersection of independent causal chains, as when two friends might meet accidentally when separately out for a walk. In the context of Darwin's theory, "chance" variation might specifically refer to the unpredictable distribution of new variations that appeared accidentally without regard for their consequences, whether advantageous or otherwise. Asking how unconventional was the idea that God might have left the world so largely to chance, Beatty gives an arresting answer: "Interestingly, the idea was favorably entertained by—of all people—Paley" (Beatty 2013, 150). Indeed, one might see more than a passing resemblance between Darwin's formula of "designed laws with the details left to chance" and Paley's declaration that "there must be chance in the midst of design" (265).

In Beatty's exposition of Paley's closing chapter, it is not only the *appearance* of chance that is designed; it is also the reality (Beatty 2013, 151). Nor was chance variation alien to Paley's vocabulary. God had designedly left some things undesigned. As an example, Paley reflected on the way in which a complex economy depends on a variety of occupations, and therefore on people of diverse ability. Because such differences are associated with differences in birth, privilege, and prestige, it would be unfair to

have them distributed other than by chance, as in a lottery (268). Chance variation was therefore integral to the world that God had designed. It was not a theological embarrassment: "Inequalities therefore of fortune, at least the greatest part of them, viz. those that attend us from our birth, and depend on our birth, may be left, as they are left, to *chance*, without any just cause for questioning the regency of a supreme Disposer of events" (268–69).

In his *Natural Theology*, Paley reflected on a problem that still besets those who write on religion and the order of nature today: how are statements about divine activity to be correlated with statements about the efficacy of "natural" causes? Paley's answer is interesting because of the generous scope he gave to the natural causes. Indeed, it was in them that divine wisdom could most clearly be discerned: "Whatever is done, God could have done, without the intervention of instruments or means: but it is in the construction of instruments, in the choice and adaptation of means, that a creative intelligence is seen" (27). Paley's message, not without modern parallels (cf. Polkinghorne 2001), was that God "prescribes limits to his own power" in conferring agency on mediating instruments, the subject of study in the natural sciences. This was a form of theistic naturalism that could be hospitable to the sciences, even if an unwitting consequence was the ease with which a more rapacious, secular naturalism might follow.

Two examples from Darwin, one from before his articulation of natural selection, the second from later, show how imprints from Paley accompanied the extension of his naturalism. One of Darwin's earliest theories, following the *Beagle* voyage, but before his reading of Malthus, grew from a question he was asking about the time of his marriage: what advantages are there in bisexual reproduction that might explain its prevalence in nature? His answer was almost Paleyesque. It was through bisexual reproduction that offspring differed from their parents, thus creating the possibility of slight changes that might enable a species to adapt better to a changing environment. This "sexual theory," as it has been called, made an ephemeral appearance in his transmutation notebooks (Kohn 1980). But it is indicative of how he was thinking before his insights into natural selection. He was effectively proposing that evolution—the transformation of species—was nature's way of preserving perfect adaptation. It was Paley's naturalism but with the addition of a time dimension.

Even after Darwin had hit upon natural selection as a perfecting mechanism, Paley was not far away, as a sounding board for testing the superiority of Darwin's ideas, but also as one who had written that, through the mediation of powers inscribed in nature, God prescribes limits to his own power. Elaborating, Paley said something surprising: "Such laws and limitations being laid down, it is as though one Being should have fixed

certain rules; and, if we may so speak, provided certain materials; and afterwards have committed to another Being, out of these materials, and in subordination to these rules, the task of drawing forth a creation" (27). Paley had pulled back; but did not doubt that "the subject may be safely represented under this view, because the Deity, acting himself by general laws, will have the same consequences upon our reasoning, as if he had prescribed these laws to another" (27).

What has this to do with Darwin? Not merely that he explored the agency of natural laws that, until 1859 at least, he was willing to ascribe to a deity. More saliently, Darwin repeatedly personified natural selection, turning it into a Being, which strangely resembles that second Being to which Paley permitted the task of drawing forth a creation. When explicating what he *meant* by natural selection in his unpublished *Essay* of 1844, Darwin offered his Being as a heuristic device: "Let us now suppose a Being, with penetration sufficient to perceive differences in the outer and innermost organization quite imperceptible to man, and with forethought extending over future centuries to watch with unerring care and select for any object the offspring of an organism produced under the foregoing circumstances; I can see no conceivable reason why he could not form a new race…adapted to new ends" (Brooke 1985, 55). Paley had written that no arguments in his possession excluded the ministry of subordinate agents (236). He had arguably left a space for the agency Darwin identified.

This partial congruence may help to explain another surprising circumstance—the willingness of Thomas Huxley to speak well of Paley when lamenting a widespread failure among Darwin's critics. Many were blind to the fact that a teleological interpretation of the Darwinian universe was still possible, its design having been seeded in its primitive configuration. Too often Darwin's conclusions were dismissed not on the evidence but on the ground that they were incompatible with belief in a Designer. Voicing his frustration, Huxley found a welcome ally in Paley: "The acute champion of Teleology, Paley, saw no difficulty in admitting that the 'production of things' may be the result of trains of mechanical dispositions fixed beforehand by intelligent appointment and kept in action by a power at the centre, that is to say, he proleptically accepted the modern doctrine of Evolution; and his successors might do well to follow their leader … before rushing into an antagonism which has no reasonable foundation" (Huxley 1887, 202). It is still possible to be surprised by Paley and how he was read. His articulation of a concept of order that embraced both laws of nature and the causal powers by which God had adapted means to ends, almost certainly facilitated more than it obstructed the expansion of scientific naturalism.

When, through the person of Cleanthes, Hume had set up a defense of the design argument that, through the skeptic Philo, he could attack, he had cleverly made Cleanthes say that it was by the *a posteriori* design argument, and by this argument *alone*, that the existence of a deity could be proved and "his similarity to human mind and intelligence" (Hume 1963, 116). Investing his argument with such unique potency, Cleanthes falls into a trap of Hume's devising. If this argument should fail, nothing would be left on which to ground inferences to a Creator. It has to be said that Paley's rhetoric would prove self-defeating through similar exaggeration. "It is," he wrote, "only by the display of contrivance, that the existence, the agency, the wisdom of the Deity, *could* be testified to his rational creatures" (27). This is just one of the several respects in which natural theology could be said to have dug its own grave (Brooke 1989b, 2020).

It was always vulnerable when it tried to exploit gaps in current scientific knowledge and suffered, too, when it risked the appropriation of what turned out to be ephemeral scientific theories. Paley's argument from anatomical contrivance to a caring Providence did, however, survive in popular scientific literature through the second half of the nineteenth century. Although a self-conscious culture of scientific professionalism increasingly eliminated God-talk from technical scientific papers, this did not prevent scientists from finding a use for natural theology, or from upholding its legitimacy when addressing a general audience (Roberts 2009, 166). It was sometimes reconfigured in the light of evolution, but with Paley's imprimatur preserved. At the very close of the century, it was still possible for George Henslow in his *How to Study Wild Flowers* (1896) to declare that "so far from the supposed truth underlying Paley's celebrated argument of the watch being disproved … scientific knowledge of today greatly extends [it]" (Lightman 2007, 92). Henslow, son of Darwin's Cambridge mentor John Henslow, argued, as had Charles Kingsley, Frederick Temple, and other Anglican divines, that a God who could "make things make themselves" was more to be admired than a God who had simply made things. Paley still had a presence, especially through the successive editions of his *Natural Theology* where the text was adjusted to accommodate the latest science, but in which Paley's central message of the compatibility of science with religious faith remained intact. The editor of the seventh edition (1875), Frederick Le Gros Clark, claimed that Paley's arguments had not been undermined by Darwin. Clark was both a surgeon and a Fellow of the Royal Society, willing in his introduction to put his scientific weight behind the same reading we have just seen in Huxley (Fyfe 2002,748–49). In that respect, he illustrates another of the rewards of revisiting Paley—the discovery of facets of his thinking that earned him sympathetic recognition in scientific quarters where one might least expect to find it.

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