A Brief Critique of Arthur Eddington's Approach to Science and Religion in Light of Evidentialism

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Abstract: Since the emergence of New Atheism under figures such as Richard Dawkins, there has been a revolution in popular Christian interest in science and religion. However, many approaches to science and religion among Christian laypeople follow an evidentialist model. In sharp contrast, Sir Arthur Eddington's different voice, as a prominent scientist and devout Quaker, remains unfamiliar to the majority in these discussions. Heralded by some commentators as ahead of his time, his unusual yet bold ideas, which at times were misunderstood, deserve renewed consideration. His influence throughout the twentieth century ran deeper than he has been given credit for. It is time to reassess his value to science and religion as a discipline and to acknowledge that his contributions have a great deal of merit for the ongoing dialogue. In this article, we question whether evidentialist approaches are as valuable as Eddington's contributions. We examine his works and life to see what can be learned from his perspective on the science-religion question. In doing so, we are also asking whether his attitude to science and religion would be more fruitful than the alternatives.

Keywords: Christian apologetics; Eddington; epistemology; evidentialism; science and religion

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The past twenty years have seen an explosion in modern popular apologetics due to the internet and social media. A brief examination of the landscape will see a proliferation of groups promoting their videos and blogs on science and religion. This explosion has seen classical, evidentialist, or cumulative-case apologetics approaches dominate, all of which promote the attitude that science provides evidence for God and points to a designer, following the nineteenth-century vision of natural theology (henceforth we shall include these under the umbrella term of evidentialism).

The sceptical climate of our post-Christian Western world may not be as conducive to these approaches anymore and, given the scientific boom of the past twenty years in multiple fields that particularly challenge the design approach (such as genetics and evolutionary biology) it is questionable why this approach has dominated. In this space, an approach more akin to Eddington's unified theory may prove far more fruitful.

Brief Biography of Eddington

Eddington was an astrophysicist who pioneered new avenues of astrophysics. He held Newton's chair in astronomy at Cambridge University and is most famous for confirming Einstein's theory of relativity in his eclipse voyage of 1919. For most of his career he held Sir Isaac Newton's chair as Plumian Professor of Astronomy at Cambridge University and was a fellow of Trinity College, Cambridge. He made great contributions to stellar physics and was the first to conclusively posit nuclear fusion as the source of the sun's energy. Einstein considered him the greatest expositor of relativity in the world, and he continued to make great strides in astronomy and astrophysics during the interwar period. He also wrote the first English language book on Big Bang cosmology.[1]

Eddington was a Quaker and wrote often on science and religion and the philosophy of science during the interwar period. Given

1 Sir Arthur Eddington, *The Expanding Universe* (Harmondsworth, Middlesex: Penguin Books Limited, 1940).

his role in illuminating relativity, Big Bang cosmology, and quantum physics to the English-speaking world, he was one of the most significant scientists of the time. He was a very popular science writer and battled the atheists of his day, most notably Bertrand Russell. He is credited with saving the faith of many Christian scientists and academics caught between fundamentalism and humanism.[2]

Eddington was the first to grapple significantly with the epistemological challenges of the new physics. Though not well received at the time,[3] recently value has been found in his work.[4] Eddington's search for a Theory of Everything (henceforth TOE) was uniquely rooted in his Christian mysticism. He spent the final decade of his life trying to find a fundamental theory, but his work was published posthumously.[5]

His polemics against materialism brought an apologetics revolution in the interwar period.[6] His motivation was a concern about the growing attitude that science had eliminated religion.[7] Eddington repeatedly asserted that the nature of all reality is spiritual[8] and sought out a philosophy of the ultimate reality that could harmonise science and faith.

2 A. Vilbert Douglas, *The Life of Arthur Stanley Eddington* (London: Thomas Nelson and Sons, 1957), 133.

3 John W. Yolton, *The Philosophy of Science of A. S. Eddington* (Hague: Martinus Nijhoff, 1960), 90.

4 Ian T. Durham and Dean Rickles, *Information and Interaction: Eddington, Wheeler and the Limits of Knowledge* (London: Springer International Publishing, 2017; Kindle), location 124.

5 Sir Arthur Eddington, *Fundamental Theory* (Cambridge: Cambridge University Press, 1945; Kindle).

6 Matthew Stanley, *Practical Mystic: Religion, Science and A. S. Eddington* (Chicago, IL: University of Chicago Press, 2007), 229.

7 Nicolaas A. Rupke, *Eminent Lives in Twentieth-Century Science & Religion: 2nd Edition* (Frankfurt: Peter Lang, 2009), 134.

8 Sir Arthur Eddington, *New Pathways in Science* (Cambridge: Cambridge University Press, 1935), 408.

Evidentialism in Science and Christianity

Classical apologetics (for example, William Lane Craig) insists on the priority of establishing theism before one makes the case for Christianity. To that end, the traditional arguments for theism developed by Aquinas and the design arguments of the nineteenth century are used or updated. Evidentialist apologetics is more direct and leans heavily on historical evidence where science is used as such.[9] In turn, cumulative-case apologetics is abductive, building a case supporting Christianity as the best explanation.[10] In all three approaches, scientific evidence for God is used to defend theism or Christianity directly. During Eddington's early life, natural theology was in ascendancy through efforts such as the Bridgewater Treatises.[11]

Given natural theology's desire to establish the case for theism in what can be known from observation of the world to all people, science is viewed principally as evidence for theism. This approach has become instinctive within modern popular apologetics (henceforth MPA) and the mind of the common church attendee who leans on Romans 1 or the Psalms for an account of how one might believe through observing the natural world.

Eddington's Approach to Science and Religion

Eddington's approach can be summarised in the following way: At the outset, he argues that relativity, cosmology, and quantum physics have radically overhauled the way we see the world, leaving mechanical or ultra-materialistic views of reality derelict. For him, mind is more fundamental than matter in how we understand and interpret the world, and a new overarching picture of reality is needed that can

9 As outlined by Gary Habermas in William Lane Craig et al., *Five Views on Apologetics* (Grand Rapids, MI: Zondervan, 2000), 92.

10 See Paul D. Feinberg's summation in Craig et al., *Five Views on Apologetics*, 151.

11 Denis R. Alexander and Ronald L. Numbers, *Biology and Ideology from Descartes to Dawkins* (Chicago, IL: University of Chicago Press, 2010).

accommodate the revolution in physics.[12] Neither materialistic atheism nor traditional and fundamentalist views of religion can supply this. His solution was idealistic (mind is preeminent), epistemological (experience is at the heart of our knowledge), and religious (the truth of God is found by the seeker, and personal knowledge of God lies outside the bounds of what science can show us). He rejected all attempts to infer God's existence from the data of science.[13] Science fuelled polemics for undermining the attempts by others to remove God on the basis of scientific advance; it did not support Christian apologetics. He cautioned on evidence-proposing apologetics saying,

> I would not venture to say that those who are eager to sanctify, as it were, the revelations of science by accepting them as new insight into the divine power are wrong. But this attitude is liable to grate a little on the scientific mind, forcing its free spirit of inquiry into one predetermined mode of expression; and I do not think that the harmonising of the scientific and the religious outlook on experience is assisted that way.[14]

Eddington didn't believe that science tells us much about God, or that science provides evidence to bolster the claims of Christianity, despite the revolutionary period during which he worked.[15] God's existence was clear on the basis of experience[16] and what it meant to be human as a spiritual being[17]—a conscious, free, truth-seeking person. Eddington's reasons to believe are not original. They are typically Victorian, Quaker, and influenced by the liberal theology of the early twentieth

12 Sir Arthur Stanley Eddington, *The Nature of the Physical World* (Shizu Bito, 2014; Kindle), location 4029.

13 Arthur Stanley Eddington, *Science and the Unseen World* (London: George Allen & Unwin Ltd, 1930), 45.

14 Eddington, *Science and the Unseen World*, 17.

15 Peter J. Bowler, *Reconciling Science and Religion: The Debate in Early Twentieth-Century Britain* (Chicago, IL: University of Chicago Press, 2001), 36.

16 Eddington, *Science and the Unseen World*, 25.

17 Eddington, *Science and the Unseen World*, 44.

century. However, he took the path of defending and upholding only a minimal, mystical form of religion, determined to leave the more nuanced details to qualified theologians. As a scientist, the data of physical science had nothing to say on his faith,[18] but the spirit and manner in which he ventured as a scientist was inseparable from his religious life. Materialist claims against this were nonsensical and self-defeating.[19] Both John Polkinghorne[20] and Alister McGrath[21] have followed similar paths in seeking an overarching vision of reality that harmonises the scientific and religious under one grand narrative.

Eddington's epistemology is far more complex than can be addressed in brief, but he attempted to demonstrate how the new physics had undercut the materialist base of the emerging humanism. The spiritual individual as seeker and observer was now put more firmly in the centre, and now we are free to consider "mind-stuff" as fundamental to the ultimate reality. From here, his more mystical idealism takes over and he asserts that the ultimate reality is mind/spirit,[22] not physical. From this perspective, materialist arguments against God's existence are nonsensical.

Examples for Comparison

The clash between the MPA approaches and Eddington is well illustrated in the following example. Eddington writes:

> We have seen that the cyclic scheme of physics presupposes a background outside the scope of its investigations. In this background we must find, first, our own personality, and then, perhaps, a greater personality. The idea of a universal Mind or Logos would

18 Eddington, *The Nature of the Physical World*, location 4096.

19 Eddington, *The Nature of the Physical World*, location 1766.

20 John C. Polkinghorne, *One World: The Interaction of Science and Theology* (London: SPCK, 1986).

21 Alister McGrath, *Inventing the Universe* (London: Hodder & Stoughton, 2015).

22 Sir Arthur Eddington, *The Philosophy of Physical Science* (New York: The MacMillan Company, 1939), 69.

> be, I think, a fairly plausible inference from the present state of scientific theory; at least in its harmony with it. But if so, all that our inquiry justifies … is a purely colourless pantheism. Science cannot tell us whether the world-spirit is good or evil, and its halting argument for the existence of a God might equally well be turned into an argument for the existence of the Devil.[23]

The more famous third sentence of this quote has been repeatedly used by Intelligent Design advocates, omitting the rest. Eddington's view is here seen to bolster a design-centred attitude to science and religion, whilst leaving out the context. Whether Eddington is being deliberately vague or not, he is content to raise the issue and note its problems to both the materialist and the natural theologian. This new science can give us significant and illuminating information, but it cannot tell us any more of what is behind it. Eddington acknowledges the plausibility of the thought but dismisses it on the problematic grounds that follow. There is data that may be used to promote an ultimate designer, but this data is ultimately problematic or irrelevant when pursued further as it cannot lead us to the relational God of Christianity, or the experiential God one communes with. It cannot be justified as good, evil, or personal. Furthermore, it says nothing about us as God-seeking or truth-seeking beings.

Eddington also candidly speaks of his experiences at the observatory in Greenwich and Cambridge, writing:

> Probably most astronomers, if they were to speak frankly, would confess to some chafing when they are reminded of the psalm "The heavens declare the glory of God." It is so often rubbed into us, with implications far beyond the simple poetic thought awakened by the splendour of the star-clad sky. There is another passage from the Old Testament that comes nearer to my own sympathies—"And behold the Lord passed by, and a great and strong wind rent the mountains, and broke in pieces the rocks before the Lord, but the Lord was not in the wind; and after the

23 Eddington, *The Nature of the Physical World*, location 4845.

> wind an earthquake, but the Lord was not in the earthquake; and after the earthquake a fire, but the Lord was not in the fire; and after the fire a still small voice … And behold there came a voice unto him, and said, What doest thou here, Elijah?" Wind, earthquake, fire—meteorology, seismology, physics—pass in review, as we have been reviewing the natural forces of evolution; the Lord was not in them. Afterwards, a stirring, an awakening in the organ of the brain, a voice which asks "What doest thou here?"[24]

It was not the sense of wonder revealed by the data of Eddington's astronomical work that gave evidence for God. Rather, the meaning and response of the heart that had led him there in the first place showed that part of being human was to seek, to pursue truth for its own sake, and to freely undertake the adventure of science.[25] These could not be accounted for by the humanism of his day, but they harmonised perfectly with his life as a Quaker, undertaking the religious life as an individual finding God in one's daily pursuits and mundane business.[26]

For Eddington, both science and religious seeking were uncovering further truth about the world as one seeks.[27] One should not seek with agenda or conclusion in mind, but with courage to follow the path wherever it leads. Given that God is personal, we should not expect to discover God in the impersonal, for "If God means anything in our daily lives, I do not think we should feel any disloyalty to truth in speaking and thinking of him unscientifically, any more than in speaking and thinking unscientifically of our human companions,"[28] and "as laughter cannot be compelled by the scientific exposition of the structure of a joke, so a philosophical discussion of the attributes of God (or an impersonal substitute) is likely to miss the intimate response of the spirit which is the central point of the religious experience."[29]

24 Eddington, *Science and the Unseen World*, 17–18.

25 Eddington, *The Nature of the Physical World*, location 4990.

26 Eddington, *New Pathways in Science*, 405–406.

27 Eddington, *The Nature of the Physical World*, location 338.

28 Eddington, *New Pathways in Science*, 406–407.

29 Eddington, *The Nature of the Physical World*, location 4634.

The natural theology of Eddington's time did not fit his concept of a God of intimate, personal communion, and MPA should consider this approach more cohesive with their view of God's nature.

How Eddington Moved the Conversation

The three approaches listed in MPA face a multitude of problems of a philosophical, theological, and scientific nature.[30] Eddington succeeded in moving the science-religion discussion away from natural theology and showed an alternative route.[31] McGrath and Polkinghorne most notably have built on the ideas of Eddington whilst dismissing aspects which were unsuccessful (for example, his TOE) and criticising his idealism in favour of critical realism. Though they do not feature prominently in MPA, they have recognised the value in Eddington's approach to the relationship between science and faith being one of seeking and values. Eddington's approach leads to nature being more of a sacrament[32] than a sign or signpost, as McGrath defines it.[33] There are similarities to Robert Boyle's comparison of the actions of the scientist as similar to communion or worship; both are forms of spiritual engagement with God in awe of God's handiwork.

Perhaps the Quaker account of Eddington satisfies more fully the idea that God holds all together, rather than the MPA approach where God is hidden behind scientific frontiers which are continually moving. Eddington makes a case that more of the mystical or experiential side of faith and science is to be retained.

Eddington was clear that whoever uses the present partially developed picture of nature for purposes outside science does so at

30 Eddington, *New Pathways in Science*, 397.

31 Stanley, *Practical Mystic*, 212.

32 Sir Edmund Whittaker, *Eddington's Principle in the Philosophy of Science* (Cambridge: Cambridge University Press, 1951), 34–35.

33 Alister McGrath, *Re-Imagining Nature: The Promise of a Christian Natural Theology* (Chichester, West Sussex: Wiley Blackwell, 2017).

their own risk.[34] In an age where atheism claims science for its own, and popular opinion is based on the warfare model, rooting evidence for God in scientific discovery is unwise due to its changeability and unhelpful history. Eddington was not looking for evidence for God, but a coherent vision of reality that holds together faith, the new science, and what it means to be human. Matthew Stanley has noted that Eddington never thought of relativity as a proof of God,[35] nor did he see quantum physics as providing evidence either. This is despite his considerable energy given to marshalling both as evidence against materialism, even going so far as to declare, in 1929, that materialism was dead.[36]

This ultimately led to the *Fundamental Theory* (published posthumously) which Eddington spent much of the final two decades of his life working on. Edmund Whittaker finished the final construction of his efforts, but it was found to fail immediately upon examination. Sir James Jeans noted that it could not account for the newly discovered subatomic particles,[37] and it was elsewhere mocked as a form of numerology. Though disregarded for having no scientific value today, we see Eddington's religious epistemology at play in trying to account for the mind, consciousness, and free will, as well as unifying the fundamental forces, constants, and quantities in nature.

Eddington's Quaker faith is largely responsible for both the rejection of natural theology and the idea that science could in any way prove God's existence, as well as his belief that what the religious believer needed was instead a grand, overarching vision of God's world which included everything made, including our own minds.

After he died, Cambridge University and the Royal Astronomical Society agreed upon an annual memorial lectureship in Eddington's

34 Eddington, *The Nature of the Physical World*, location 5044.

35 Stanley, *Practical Mystic*, 192.

36 Arthur Stanley Eddington, *Science and the Unseen World* (London: George Allen & Unwin Ltd, 1930), 31.

37 Sir James Jeans, *The Astronomical Horizon* (London: Oxford University Press, 1945), 20.

honour, which would focus on the interaction between science, philosophy, and religion. The vision he had, of seeing the three disciplines in continual interplay, was fruitful as the transcripts were published annually until the mid-1970s by Cambridge University Press (the lectureship ran until 2001, being restarted in 2009 with the sole focus on astronomy) and included philosophers of religion such as John Hick, Christian scientists such as Michael Polanyi, and multiple Nobel Prize winners who continued Eddington's emphasis on mind, such as Sir Roger Penrose.

Given this legacy, his extraordinary success as a popular communicator of science, philosophy, and religion, his engagement with the considerable antagonists of the time (particularly Bertrand Russell), and his ability to reframe the conversation away from natural theology, it is perhaps surprising that Eddington has not garnered more attention from religious thinkers in our present era. However, there are a few reasons that have been given.

Criticisms of Eddington

Eddington's approach as a Quaker may be too mystical and ambiguous for many conservatives yet finds a deeper appreciation from more liberal Christians. Eddington has drawn criticism from almost every side, both during his life and in the aftermath of his death. Whilst this deserves greater attention than can be given here, an aforementioned notable critic was his Cambridge University contemporary Bertrand Russell. Though admired by Eddington, Russell continually castigated him through the 1920s and 1930s, most evidently in his books *The Scientific Outlook*[38] and *Religion and Science*,[39] in which he furiously mocked both Eddington and Sir James Jeans for bringing the new findings of physics into conversation with Christianity, and scorned clergy for citing them as reliable sources for their evangelism. Stanley and others have observed that in Russell's criticism of natural theology is appar-

38 Bertrand Russell, *The Scientific Outlook* (London: Routledge Classics, 2009).

39 Bertrand Russell, *Religion and Science* (Oxford: Oxford University Press, 1997).

ent that Russell had neither read nor understood Eddington's more nuanced perspective on science and religion, which was far removed from that of Jeans in his most popular work, *The Mysterious Universe*.[40] We bring this to light as Russell was the most famous atheist of his era, whose *Why I Am Not a Christian*[41] is still a popular tract of atheist writers today. The fact that Russell wrote an entire book attacking the religious affections of a well-read spiritual scientist during the same era in which he wrote his most popular atheist treatise, yet few Christian apologists seem to be aware of Eddington, is surprising. Eddington even wrote his own brief counter, *Why I Believe in God*,[42] shortly afterwards.

There appears to be gold to be mined here, both in Eddington's writings and in his critics. Others followed Russell's suit in writing responses to Eddington, who has been credited with rescuing the faith of many scientists[43] who felt forced to make a difficult choice between their science and religion by the rising tide of fundamentalism in the interwar period. Fundamentalism was boosted by early twentieth-century religious revivals in the United States and incidents such as the Scopes Monkey Trial of 1925. Chapman Cohen and those at the National Secular Society sought interviews and published responses in magazines to compliment the books of Russell.[44] Eddington was an important voice in the BBC's first ever symposium on science and religion, in 1930.[45] Indeed, the more one explores his voice during this period, the stranger it seems that it is largely forgotten today.

40 Sir James Jeans, *The Mysterious Universe* (Cambridge: Cambridge University Press, 1930).

41 Bertrand Russell, *Why I Am Not a Christian* (London: Routledge Classics, 2004).

42 Sir Arthur Stanley Eddington, *Why I Believe in God: Science and Religion as a Scientist Sees It* (Girard, KS: Haldeman-Julius Publications, 1930).

43 A. Vilbert Douglas, *The Life of Arthur Stanley Eddington* (London: Thomas Nelson and Sons, 1957), 107.

44 See, for example, Chapman Cohen, *God and the Universe: Eddington, Jeans, Huxley and Einstein* (London: Pioneer Press, 1931).

45 *Science and Religion: A Symposium* (London: Gerald Howe Ltd, 1931).

Another important factor in the disappearance of the influence of both Eddington and Jeans in Christian apologetics around science and religion is the rise of C. S. Lewis. In postwar Britain, there was a desire for a new start in many fields, and Lewis became the leading popular Christian apologist. Whilst Eddington's work was forgotten by many, it certainly was not by Lewis, who refers to it in several of his writings. As Lewis' impact grew, it coincided with both the more silent later part of Eddington's life, where he published little, and the immediate aftermath of Eddington's death. Certainly, Lewis' writing is far more directly applicable and easier to comprehend than Eddington's in respect of religion.

Perhaps the greatest reason for sidelining Eddington is that natural theology has been thoroughly engrained in the Christian consciousness as the *de facto* approach to science and religion—or in defending faith against critics with scientific evidence.

Conclusion

In our present situation, Eddington's search for a better approach to the science and religion dialogue may be far more fruitful than the new revival of natural theology seen in philosophy of religion and popular movements such as Intelligent Design. Despite the nineteenth- and twentieth-century revolutions in physics and biology challenging so many traditional arguments for God, it is puzzling that so much of the field is reviving natural theology, when Eddington saw fruitful responses in his revolutionary context of interwar physics.

Perhaps the seeming lack of conviction in his writing is not as attractive as the reasoning of MPA. His emphasis on values and seeking over proofs and evidence is less attractive to contemporary Christian apologists than that of William Lane Craig's approach. But Eddington's approach does have clarity. He says,

> I think it is something of the same kind of security we should seek in our relationship with God. The most flawless proof of the exis-

> tence of God is no substitute for it; and if we have that relationship the most convincing disproof is turned harmlessly aside. If I may say it with reverence, the soul and God laugh together over so odd a conclusion.[46]

Eddington's approach ends with a faith less disparate than one which is segmented over God's relationship with science and the natural world.

His Quakerism is seen as alien to the Evangelical faith that breeds MPA today. We argue that the faith Eddington presents is far more living and active than that presented by natural theology.

Eddington's God is present and engaged daily, rather than remote and rarely intervening. Despite this, many in the popular conversation over science and religion continue to celebrate the natural theology of William Paley and others, whose work outdates Eddington and whose approach carries the impression of repeated defeat in the past two centuries at the hands of advances in biology, among others. Eddington presents an entirely different and fruitful approach, in an era of immense historical significance. We suggest it warrants further consideration.

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46 Eddington, *Science and the Unseen World*, 43.